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# SHAPED

Exploring Wellbeing Through Play, Virtual Reality, and Abstraction

# ABSTRACT

Happiness and wellbeing are of increasing value in today's society. Maintaining balance in personal wellbeing is an ongoing challenge as there are many causes to unbalance the scales. These range from an increase in the focus society places on personal responsibility that is pushed by modern liberal humanist culture, to the rise in use of social media, social isolation and global challenges such as COVID-19 and climate change. Young people aged 18-25 are especially vulnerable as they are still forming crucial components of mental capital, or capability to deal with challenges in life, and their abilities to maintain high levels of wellbeing (*Foresight Mental Capital and Wellbeing Project*, 2008; Kvalsvig, 2018; Marks et al., 2021). Happiness and wellbeing are growing areas of importance for governments and researchers alike (*World Happiness Report 2022*). There is a need for innovative wellbeing initiatives that appeal to younger people. These need to avoid the typical conventions and connotations of "treatment," and approach wellbeing as a fluid state. Video games, a popular pastime, is currently a promising area through which to increase young people's investment in wellbeing. By exploring the positive psychological elements of game design and utilising the immersive and intuitive interaction capabilities of virtual reality, this project aims to combine elements of wellbeing in game design into an approachable experience.

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# INTRODUCTION

This body of research began as an exploration of happiness. What it means to be happy, why we value happiness and how it can be improved. I was interested in broad and general examples of happiness, and initially looking at humanity as a whole, not just a specific audience. Yuval Harari's works *Sapiens* (2015) and *Homo Deus* (2018) explore the systematic causes for happiness by looking at broad trends in the cultural, social and technological progress of humanity. He argues that the majority of the population lives in a society dominated by liberal humanism, one that is focused on the importance of the self as the driver of one's life. Liberal humanism dictates that happiness is caused by what one believes makes them happy, placing an emphasis on personal belief. Alternatively Daniel Kahneman describes in his work *Thinking Fast and Slow* (2013), how the human brain functions in unintuitive ways and explores the mind through a series of physiological experiments. He helps us to break down the functioning of the mind, not into a single self, but into two systems: system one, the experiencing self, and system two, the narrative self. These two systems often contradict each other. The understanding of how these two systems interact brings to the surface the complications of happiness and its causes. This leads to widening our search to wellbeing - a broader and more complex topic than just happiness. Because the causes for happiness can be so subjective we need to look at wellbeing as it can be more clearly defined and measured.

Wellbeing needs to be defined in order to find solutions or methods for those who need them in order to overcome the challenges maintaining a balanced level of personal wellbeing. *The Challenge of Defining Wellbeing* (Dodge et al., 2012) as well as *The Five Ways to Wellbeing* (*Five Ways to Wellbeing*, 2009) offer definitions and practical, actionable steps that people can take to maintain positive wellbeing. These techniques are especially important for younger people, who are being taught crucial lessons of how to approach negative influences on their wellbeing (Kvalsvig, 2018), are still forming techniques to maintain mental capital and wellbeing balance (*Foresight Mental Capital and Wellbeing Project*, 2008) and are more likely to be anxious and depressed due to isolation, COVID-19 and the global climate emergency (Marks et al., 2021). These definitions and techniques are already used by many governments and societies around the world as the importance of not just a productive society, but one where the population's wellbeing and happiness are valued as equally as gross domestic product (GDP) becomes clear (Helliwell et al., 2021; Jarden et al., 2013; Kahneman, 2013). For example in 2019 New Zealand released its first 'Wellbeing Budget' specifically shifting focus off GDP and onto the wellbeing of

its population indicating the direction of future policy (Robertson, 2019). For this project students at Massey University will be the target audience as they are mostly within the identified age range and situated in a high stress environment. They are a representation of a wider audience to which this could potentially be developed for. This project aims to avoid being a treatment tool. This is due to the reluctance to engage with wellbeing treatment due to stigma, psychological barriers or perceived failure (Andrade et al., 2014). There is already an industry built around wellbeing treatment and the existing aesthetics and associations with that industry are something this project intends to keep at a distance. By presenting work that avoids existing material and appeals to a younger audience we can sidestep some of these barriers.

Young people are already aware of a common tool used to boost mental wellbeing: that of video games. Video games are played by a massive amount of people, with more than half of them being under 34 (*2021 Essential Facts About the Video Game Industry*, 2021). There are many positive psychological benefits to video game play as detailed and summarised by Jamie Madigan in *Getting Gamers* (2016) and Jamie McGonigal and *Reality is Broken* (2011). Fiero, or triumph over adversity, or flow, a satisfyingly and exhilarating sense of creative accomplishment and heightened functioning are both significant and common positive psychological benefits present in many video games. By defining what a game is, through *Rules of Play* (Tekinbaş & Zimmerman, 2003) and what makes them so fun, successful and rewarding, we can extract the mechanics that are most closely related to wellbeing. Games such as *Journey* (Chen, 2012) and *KIDS* (Richenbach & Frei, 2019) are examples where complex themes and simple aesthetics combined with puzzle solving mechanics, allow Kahneman's system two to begin constructing narratives and meaning, opening a space where players can explore more complicated themes, like wellbeing, through gameplay.

This narrative space is further explored in abstract works by early 20th century painters such as Hilma af Klint, surrealists; Giorgio de Chirico's and Rene Magritte, and modern artists like Andreas Wannerstedt and teamLab whose use of strange environments, abstract shapes, strong colours and illogical juxtaposition give a strong sense of atmosphere, something that can be replicated in a virtual world and used to enhance the players sense of immersion, and engagement with the game. The importance of immersion is why the platform of Virtual Reality (VR) will be used for this game. A

stereoscopic headset presents a 3D view of the virtual world, which paired with controllers gives the player the freedom to look and interact with objects in the virtual world on a 1:1 scale. This enhanced immersion, combined with the natural and relatively intuitive control system offered by VR, allows for harnessing mechanics focused on wellbeing more effectively than other platforms.

The instigation of this project was fuelled by a desire to understand myself as a designer, and to consolidate my skills and gain a deeper understanding of a specific body of knowledge. My background is in videography, animation primarily 2D with a strong focus on technical design rather than finely crafted refined works. The ideas and the concepts that form the foundation for the design process are the most interesting to me. The challenge brought by exploring new technical domains such as Unreal Engine, game design and virtual reality are such that the final outcome will only be of limited scope. This will be a functioning prototype with a focus on game mechanics and their impacts on the player. Aesthetics will be carefully considered but are not the primary focus of this project.

The methods of development and exploration were both systems heavy and highly iterative. I approached theory exploration using Nigel Cross' convergent design method (Dubberly, 2008), exploring topics and ideas around video games and wellbeing, then converging the research into more targeted ideas. This research was analysed with mind maps, axis mapping and mood boards on Miro, a collaborative whiteboard platform (see Appendix A). For game design methods I referred to the definition of games as defined in *Rules of Play* (Tekinbaş & Zimmerman, 2003) and the MDA framework for a design foundation (Hunicke et al., 2004). I used these theories, in combination with wellbeing elements from *Five Ways to Wellbeing* to design mechanics and content for the game. The software design process follows a slightly different method that requires a more iterative process, with game mechanics having to be tested, iterated and tested again. The primary function of this prototype is to use virtual reality video game mechanics to facilitate the diversity of wellbeing actions for young people aged 18-25.

# THE SYSTEMS OF HAPPINESS & WELLBEING

Yuval Harari's *Sapiens* (2015) follows the story of humanity from its dawn, to modern day. Along the way Harari outlines some general causes of human happiness. Covering a wide variety of theories which range from; happiness as simply a release of chemicals in the brain, happiness is orientated around family and community connections, happiness is progress, so as humanity progresses life gets easier and thus happier, to cultural constructs such as liberalism and humanism as ultimate determinants of happiness. He also describes happiness as a subjective rather than objective concept: *Homo Deus* (Harari, 2018) follows *Sapiens* (2015) and expands on the driving force of modern culture are liberal humanist ideals (Harari, 2018). He summarises the influence of humanism with five statements.

“Humanist Politics: the voter knows best.

Humanist Economics: the customer is always right.

Humanist Aesthetics: beauty is in the eye of the beholder.

Humanist Ethics: if it feels good - do it!.

Humanist Education: think for yourself.” (Yuval Harari, 2018, p. 213)

These statements show the influence that liberal humanist ideals have on modern society and how deeply they are imbedded in modern culture. Harari (2018) describes liberal humanism as a philosophy that focuses on the individual for what is true and meaningful. These ideals prioritise the value of human life and the freedom of the individual's expression above all else. A liberal humanist values experiences of the self by drawing meaning through experiences in life, and vicariously through others. By broadening this experience, liberal humanists can enhance their sensitivity and understanding of the world. According to this philosophy one must look inside oneself to find the meaning for one's existence. This in turn, places the responsibility of happiness purely on the self and the search for meaning. Harari's work gives provides an outline for causes for happiness and provides us with a reasonable, if somewhat generalised, explanation for the driving factors motivating individuals to search for it.

Daniel Kahneman's *Thinking Fast and Slow* (2013) begins to break down this assumed importance of the self. Kahneman explores the workings of the mind and the brain through a series of psychological experiments that challenge our assumptions of how logical and rational human minds actually are. For example, subjects in Kahneman's experiments were highly likely to be fooled by common heuristics and biases, or pre-determined shortcuts the brain uses to make quick decisions. An effect called loss aversion describes how subjects prioritised avoiding loss more than they valued an equally valuable reward. Statistics, judgement, emotions and memory all have strong influences on what one would normally think of as a rational decision making process. Kahneman describes two systems that make up the mind:

“The attentive system two is who we think we are. System two articulates judgments and makes choices, but it often endorses or rationalises ideas and feelings that were generated by system one” (Kahneman, 2013, p. 333)

These systems can alternatively be described as the experiencing self and the narrative self (Kahneman, 2013). One self is experiencing and reacting instinctively to the outside world and the other, slower system is digesting information and constructing a cohesive narrative that conforms to a consistent internal image of the self. These two systems are constantly conflicting with each other in order to maintain this consistent image of a cohesive self, even if that contradicts so called 'rational' behaviour. This breakdown of the reliability of the self directly contradicts the core value of liberal humanism with its strong emphasis on the importance of self belief. Kahneman said “...people don't want to be happy ... They want to be satisfied with their life.”(Mandel, 2018 para. 34). We are left with two contradictions, one that leaves us with an unreliable sense of self, and the other that relies on that very sense of self to make rational decisions to engage with liberal humanist culture.

“Happiness is not the surplus of pleasant over unpleasant moments. Rather, happiness consists in seeing one's life in its entirety as meaningful and worthwhile.” (Yuval Harari, 2015, p. 103)

# WELLBEING IN SOCIETY

“Equally important as that base of evidence about well-being ... is the *narrative* change that is key for society to begin to privilege human experience in its conception of progress.” (Helliwell et al., 2022, p. 55)

These contradictions lead to a wider look at happiness and expansion into the larger topic of wellbeing. The search for happiness itself can be related to poor wellbeing (Catalino et al., Maus et al, as cited in Gentzler et al., 2019). Happiness can't be reliably measured objectively; one of Kahneman's insights into memory and the recall of events led to the realisation that the duration of an event didn't influence how much positive or negative emotion was experienced (Kahneman, 2013). Expectations had a much stronger influence on happiness than the experience itself (Bastian et al., 2014; Gentzler et al., 2019; Kahneman, 2013). Wellbeing however, encompasses a broader picture that includes many aspects of one's life and can be measured through a variety of factors and is defined through a range of varied models (Dodge et al., 2012). Components of wellbeing, such as the frequency of positive and negative feelings, are, like happiness, subjective - but there are more objective aspects such as physical health or socio-economic status. The Gallup World Poll (Helliwell et al., 2021) aims to give a broad sense of the wellbeing of the entire world using some of these measurements. Their conclusion is that in the last few years there has been a global decrease in happiness and wellbeing. Major factors contributing to this decrease are: concerns about climate change, shifting social dynamics due to new social technology and COVID-19 affecting the entire world population (Helliwell et al., 2021; Marks et al., 2021; Twenge et al., 2018).

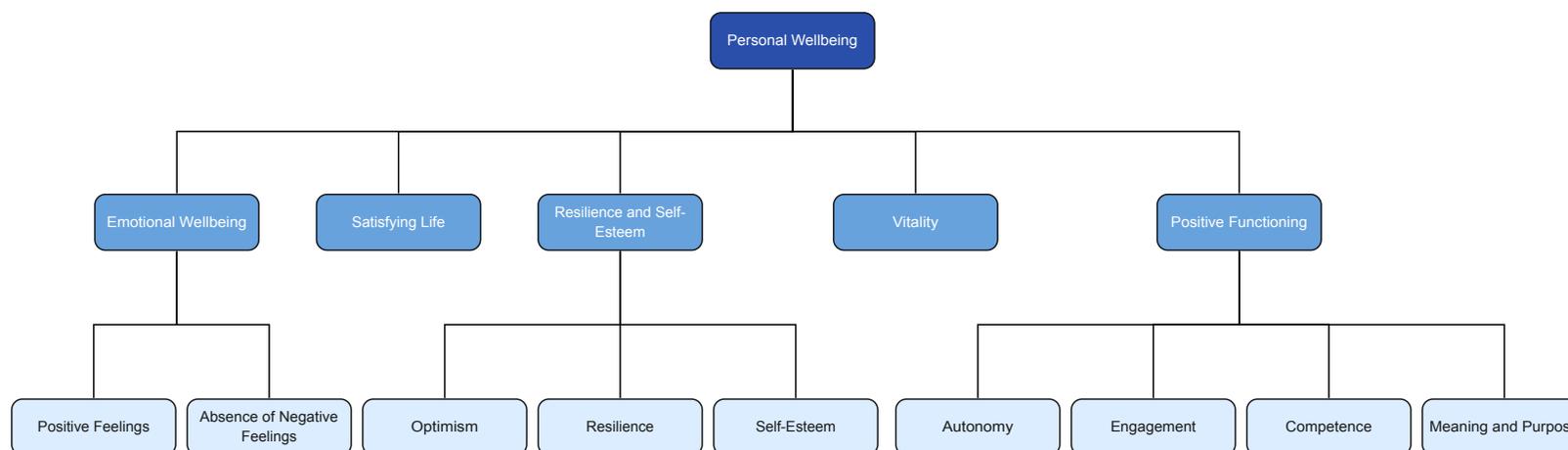
Many nations have started valuing wellbeing as a key indicator of a nation's success (Helliwell et al., 2021; Jarden et al., 2013; Kahneman, 2013). The focus on raising the wellbeing of the entire population, not just those with lower wellbeing, allows the policies and results to be broader, affecting as much of the population as possible (*Foresight Mental Capital and Wellbeing Project*, 2008; Jarden et al., 2013). Helping both those with poor wellbeing and also pushing those with higher levels of wellbeing to flourish, or experience peak life satisfaction.

New Zealand demonstrates this shift in focus with the 2019 'Wellbeing Budget' specifically shifting focus off GDP and onto the wellbeing of its population, a policy focus that has continued since then (Robertson, 2019). This indicates the awareness that those with poor mental wellbeing are not always easy to identify. For example Wellington, and Auckland are measured as some of the least stressful cities to live in the world as measured through a combination of factors (*The Most Stressful Cities Index 2021, 2021*). Yet the mental health of the citizens is ranked as low as 50% compared to other cities worldwide that were included in the study (*The Most Stressful Cities Index 2021, 2021*). This indicates that it's not just the environment that we live in or the government we live under that impacts on our mental health. New Zealand ranks reasonably highly on life satisfaction indexes, yet 17th for personal wellbeing and two thirds of young people were likely to report a meaningfully depressed mood (Jarden et al., 2013). These New Zealand youth are more vulnerable to negative influences on wellbeing than their adult counterparts (Kvalsvig, 2018). Mental capital, or the ability to cope with stressful decision making, is in a transitional phase for young people as they shift from family life to adult life, this time period is crucial for wellbeing support (*Foresight Mental Capital and Wellbeing Project, 2008*). Climate and COVID anxiety for youth are increasing factors of anxiety and increase vulnerability towards developing mental health problems (Helliwell et al., 2021; Marks et al., 2021). The 2020 budget for education providers in New Zealand provided \$25 million specifically for tertiary student wellbeing (*\$199 Million Education Wellbeing Package Now Complete, 2020*), indicating the growing awareness towards the issue of youth and student wellbeing.

“It is proposed that achieving a small change in the average level of wellbeing across the population would produce a large decrease in the percentage with mental disorder, and also in the percentage who have sub-clinical disorder (those “languishing”).” (*Foresight Mental Capital and Wellbeing Project, 2008, p. 28*)

# DEFINING WELLBEING

In order to approach this daunting wellbeing we can look at the range of definitions and models of wellbeing that describe a highly diverse topic. A wellbeing framework can be seen in figure 1. This framework illustrates the interconnected nature of many elements and how they form the different aspects of wellbeing. Note that 'positive feelings' or happiness is only one element in this model. By contrast Figure 2. *Te Wheke* or *The Octopus* created by Rose Pere (Pere & Nicholson, 1997) provides a more holistic model. This model describes the different aspects of wellbeing through a focus on elements of both traditional Māori wellbeing and more modern ideas. These are portrayed through the body of an octopus, with each arm of the octopus representing a different structural component of physical, social and spiritual wellbeing. The interconnected nature of wellbeing is more accurately represented through the complexity of an animal and the implications of its representation through an intelligent creature such as the octopus. The addition of an animal metaphor rather than the traditional diagrams add a level of authenticity and metaphor that gives more room for some of the more ineffable elements of wellbeing.

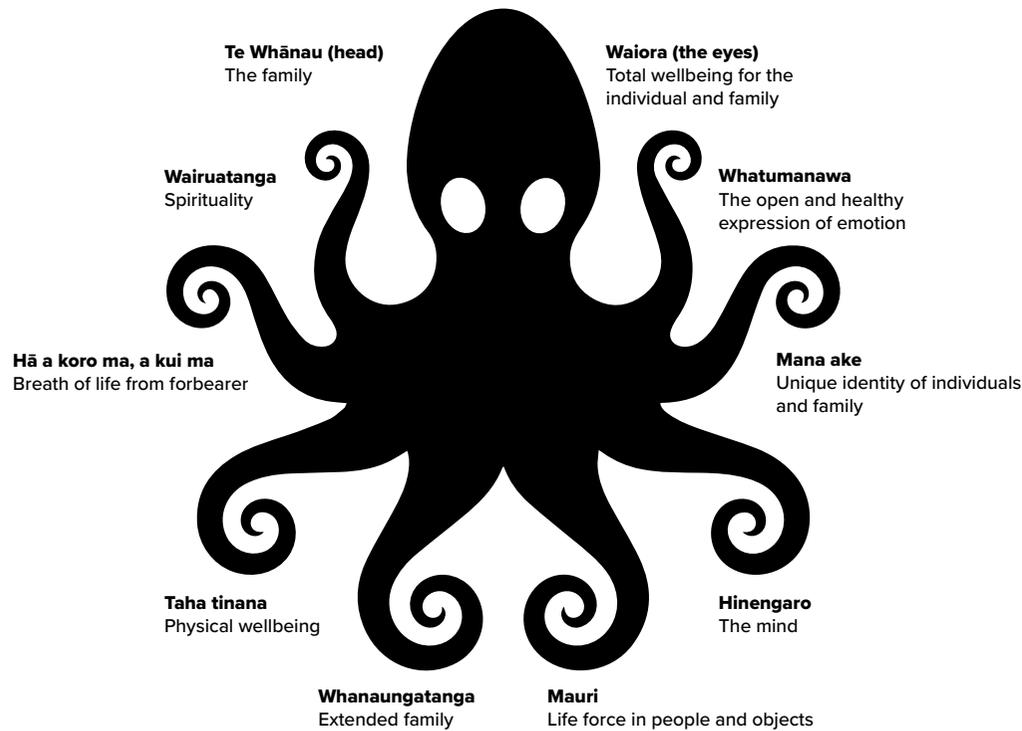


**Figure 1**

*Wellbeing Framework*

*Note.* An example of a wellbeing framework. Notice that positive feelings or happiness is only one element of the larger concept of personal wellbeing. Based on a figure by Michaelson et al., 2009, p21.

# TE WHEKE



**Figure 2**

*Te Wheke*

Note. A holistic model of Māori wellbeing, with the head, the eyes and the arms representing different aspects of wellbeing. Based on the model by Pere & Nicholson, 1997.

*The Challenge of Defining Wellbeing* (Dodge et al., 2012), discusses models of wellbeing, trying to incorporate a range of factors including: environmental factors, anxiety, mental capital, emotion, social support and autonomy. The authors ultimately conclude that wellbeing is both complex and is constantly in fluctuation, not a static slowly changing condition. Their definition is depicted with the diagram in figure 3. This theory describes the delicate balance where each individual has to constantly adjust the resources and challenges in their life, too much or too little of either can result in an unbalance of wellbeing. While being deliberately simple, it is a clear indication that both a lack of resources, as well as a lack of challenge in one's life can cause a decrease in the delicate balance of maintaining wellbeing.



**Figure 3**

*Definition of Wellbeing*

Note. The careful balancing act of balancing resources and challenges to maintain a balanced wellbeing. Based on a model from *Challenge of Defining Wellbeing* by Dodge et al., 2012, p. 230.

# WELLBEING STRATEGIES

Forming out of a need to reduce the complexity and abstract nature present in many of these models, is a strategy implemented by the Mental Health Foundation of New Zealand. This was based on the New Economic Foundations work *Foresight Mental Capital and Wellbeing Project* (2008). *The Five Ways to Wellbeing* (2009) as seen in figure 4, are concentrated on giving five practical solutions and actionable steps than anyone could take in order to increase their personal wellbeing. These were highly appealing as they were clear, realistic and achievable for all. I have used these five concepts as a core focus and starting point for my design response. To briefly paraphrase each of these elements and expand on why they are important:

**Give:** This is about giving your time to others. Being social and connecting with others is beneficial to both the giver and receiver and helps to form stronger social connections

**Be Active:** Exercise and physical activity are key in activating your physiological systems which can have strong effects on your mood, as well as being in a different environment.

**Keep Learning:** New experiences, knowledge and opportunities help people to flourish and broaden their horizons.

**Connect:** Talking and engaging with the community. Those who are more connected to a group or community have stronger social support and higher levels of wellbeing.

**Take Notice:** Gratitude, meditation and enjoyment of smaller things help to enable a more realistic point of view and appreciation for more positive aspects in life.

## Figure 4

*The Five Ways to Wellbeing Poster*

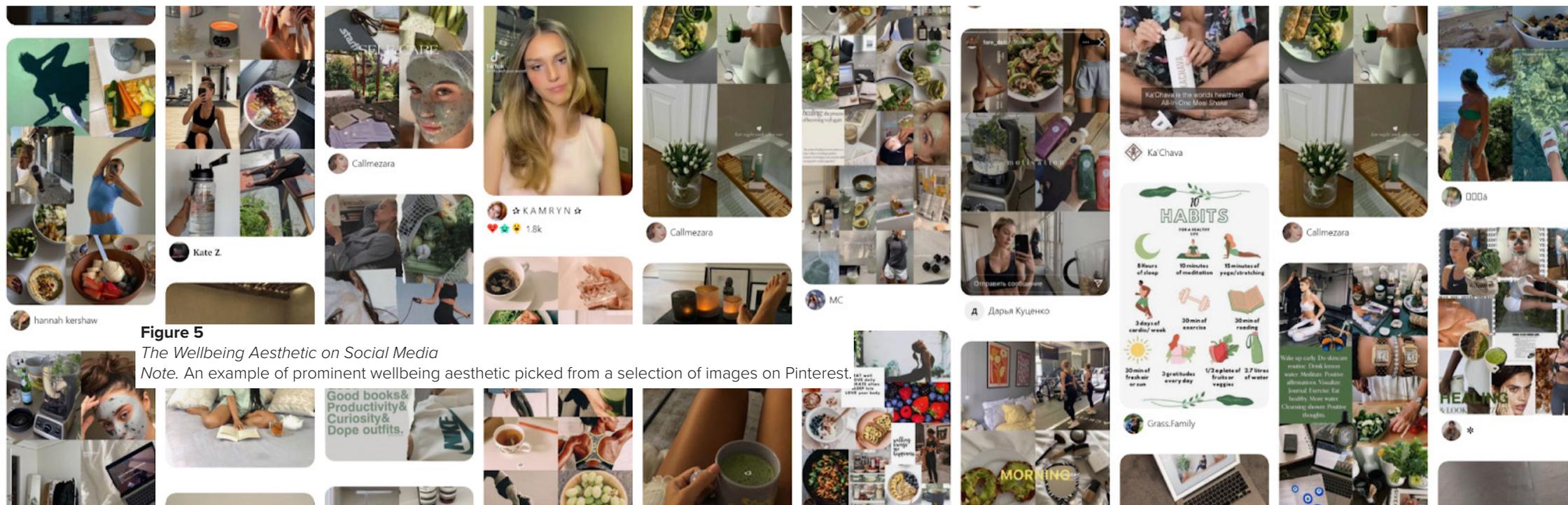
Note. An introduction to each of the Five Ways to Wellbeing and their summaries.

From *The Five Ways to Wellbeing* by The Mental Health Foundation, 2009

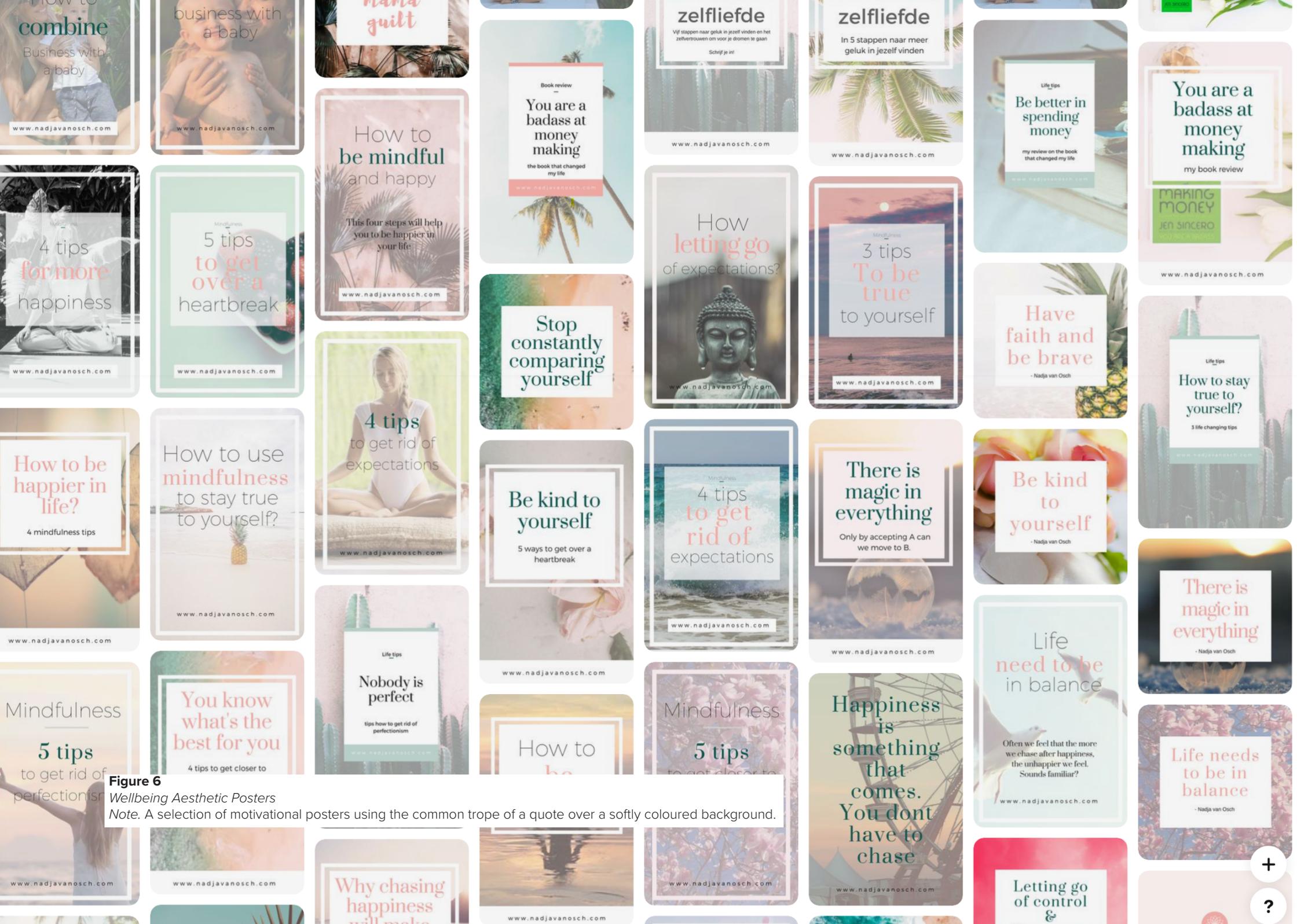


# WELLBEING CHALLENGES

*The Five Ways to Wellbeing* also helps to overcome some of the stigma associated with asking for help and treatment for those suffering from poor mental health, something that is common in New Zealand (Kvalsvig, 2018). Despite the increased awareness and acknowledgement there is still a strong stigma against asking help or admitting to suffering from poor wellbeing. This is especially true if a person is inexperienced or unfamiliar with the idea of poor mental health (Kvalsvig, 2018). There is a constant cultural push for success and poor mental health is seen as an individual failure rather than as a potential combination of factors outside of the individual's control (Andrade et al., 2014). Increasing mental health awareness is important to help remove these perceived barriers. The awareness of mental distress in oneself or others is associated with more positive attitudes (Kvalsvig, 2018). Another potential barrier lies within the commercialisation of wellbeing treatment. Wellness describes a healthy lifestyle beyond acute illness, and is a component of wellbeing (Pendell, 2021). The wellness industry covers everything from mental wellness, physical wellness, personal care and beauty and even wellness tourism. It has exploded with many therapies, self help techniques and products saturating a \$4.4 trillion industry (*Wellness Industry Statistics & Facts*, 2021). While it is possible some can find success, there is an element of exploitation with the commercialisation of wellbeing with internet self help and guides and influences available on almost all social media platforms (see figures 5 & 6).



**Figure 5**  
*The Wellbeing Aesthetic on Social Media*  
 Note. An example of prominent wellbeing aesthetic picked from a selection of images on Pinterest.



**Figure 6** Wellbeing Aesthetic Posters  
Note. A selection of motivational posters using the common trope of a quote over a softly coloured background.

Many issues can occur here, with misdiagnosis and the assumption that these methods are more effective than they perhaps are (Gould & Clum, 1993). Social media also invites comparison of the self to others which has a negative influence with wellbeing (Kross et al., 2021). The stylistic themes and aesthetic choices are very common with a strong focus on traditionally soft, or natural, colours, thin serif fonts and rounded shapes. Figure 5 shows the highly crafted content ranging from diet, exercise, meditation or mental health strategies conform to a culturally defined aesthetic. A defining statement with centred text overlaid on a background of a peaceful environment, with soft pastel colours are typical features of inspirational posters as seen in figure 6. This aesthetic is parodied by *Inspirobot* (2017) a website that defines itself as “...an artificial intelligence dedicated to generating unlimited amounts of unique inspirational quotes for endless enrichment of pointless human existence” (*InspiroBot*, 2017, para. 1). The often nonsensical text is randomly generated and shows just how easily the narrative brain is able to construct a supposedly meaningful narrative around an artefact and how little effort it takes to take advantage of system two. It illustrates how catchy titles and composed backgrounds can give the illusion of sincerity even if in the case of some wellbeing products are not based on well researched methods. Wellbeing treatment is something that this project aims to avoid, the topic is complicated and requires nuanced and individualised treatment as well as correct identification of causes. It is something that is beyond the scope of the project. Wellbeing awareness however, is something that is more approachable. If the understanding of wellbeing, and its components can bring about even a small balancing of the scales of wellbeing (see figure 3) then we can consider it a success. The goal is for participants to experience some of the techniques that contribute to wellbeing through a fun and engaging experience. An example of this type of non-confrontational method, that doesn't cross the boundary into treatment, is that of play.



**Figure 7**  
*Inspirobot Inspirational Posters*  
Note. A collection of randomly generated inspirational posters, using an algorithm to create unique posters.

# DESIGN FOR PLAY

Play is a set of motivated activities that a user engages with for pleasure or entertainment. Games are a method of play that generally define a set of rules. People seem to understand that they will feel better after playing (Johnson et al., 2013) and Jamie McGonigal in *Reality is Broken* (2011), provides us with a statement about why.

“Games are providing rewards that reality is not. They are teaching and inspiring and engaging us in ways reality is not. They are bringing us together in ways that reality is not” (McGonigal, 2011, p. 11)

Before we delve into the positive wellbeing aspects of games we need to look at the definition of ‘games’. Games have a broad range of definitions with a wide variety of possible features. Some of these include games; that must not be serious, are a form of art, must be voluntary or never associated with material gain (Tekinbaş & Zimmerman, 2003). Not all of these are applicable to this project and we can look to *Rules of Play* (Tekinbaş & Zimmerman, 2003) that analyses these definitions and distils them down into six key elements that we can use to help explore examples and analyse the prototypes later in this project. They are paraphrased below.

**Systems:** Or a group of interacting objects or elements with attributes that relate to each other within an environment.

**Players:** Participants of the game, ones who interact with the systems in order to play the game

**Artificial:** Separation from the ‘real world’ in space and time, through artificially defined means.

**Conflict:** Games must involve a challenge of some form either through systems or other players

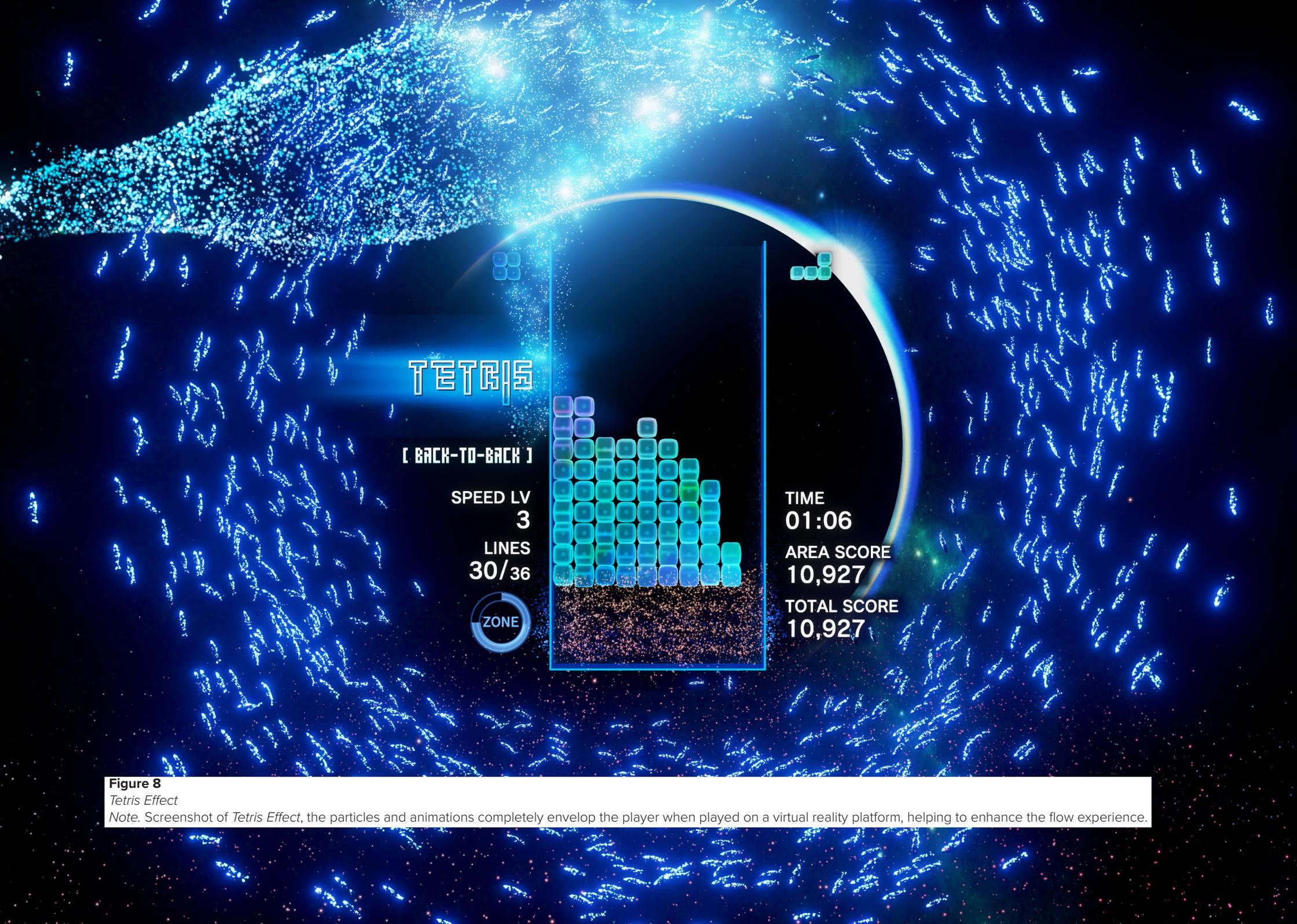
**Rules:** Rules defining the structure of the game and providing conflict and challenge.

**Quantifiable Outcome:** A goal or conclusion to the game. Usually a score that denotes winning or losing.

# PLAYERS AND POSITIVES

One ubiquitous type of game is the video game. Video games are electronic software that run on a digital platform. These platforms range from a smartphone or tablet all the way up to a high end gaming console or PC. Young people are an audience where video games are almost ubiquitous (Johnson et al., 2013). Up to 90% of Australian young people aged 16-25 played video games (Johnson et al., 2013) and the Entertainment Software Association estimates that two thirds of Americans play games weekly with 38% of them aged 18-34 (*2021 Essential Facts About the Video Game Industry*, 2021). There are many positive correlations with mental wellbeing and video games such as increasing mood, stress reduction, self esteem improvement and social engagement (Johnson et al., 2013). Playing games helps to unleash creativity and strategic thinking and the feedback provided through the achievement of goals provides the motivation to continue (McGonigal, 2011). Jane McGonigal in *Reality is Broken* (2011) and Jamie Madigan in *Getting Gamers* (2016) both discuss who these players are and many of the psychological effects that allow people to enjoy games so much. McGonigal states that video games provide a highly visceral sense of feedback; a varying sense of challenge that can be adapted for peak enjoyment; a sense of satisfying work, achievement and progression; and social connections through both local and remote communication.

*Ring Fit Adventure* (Nintendo Entertainment Planning & Development, 2019), is a Nintendo Switch game that employs the use of a fitness ring in order to create an interactive, fitness, role playing adventure game. The player must do exercise sets in order to defeat enemies and progress through an adventure. This provides an example of a strong emotion called 'feiro', or triumph over adversity, a primal and powerful neurochemical high (McGonigal, 2011). The game also produces a sense of satisfying work, as progression that would normally not be visible in terms of physical fitness is expressed through levelling up of a virtual character. This sense of satisfying work and accomplishment has deep neurological roots and successful games seek to activate these emotions (McGonigal, 2011). *Tetris* (Pajitnov, 1984) is a simple game about fitting falling blocks into a grid under ever increasing speeds. Tetris is commonly associated with the concept of 'flow' a satisfyingly and exhilarating sense of creative accomplishment and heightened functioning as described in Mihály Csíkszentmihályi's work *Boredom and Anxiety* (1975) and frequently referred to in both studies of happiness and video games (Dodge et al., 2012; Madigan, 2016; McGonigal, 2011; Tekinbaş & Zimmerman, 2003). The newest version of *Tetris*, called *Tetris Effect* (Mizuguchi, 2018) is focused on enhancing that effect with a virtual reality version (Stark, 2018). This surrounds the player with pulsing 3D environments so as they play each level the whole world moves and changes in time to their placement of blocks.



**Figure 8**

*Tetris Effect*

Note. Screenshot of *Tetris Effect*, the particles and animations completely envelop the player when played on a virtual reality platform, helping to enhance the flow experience.

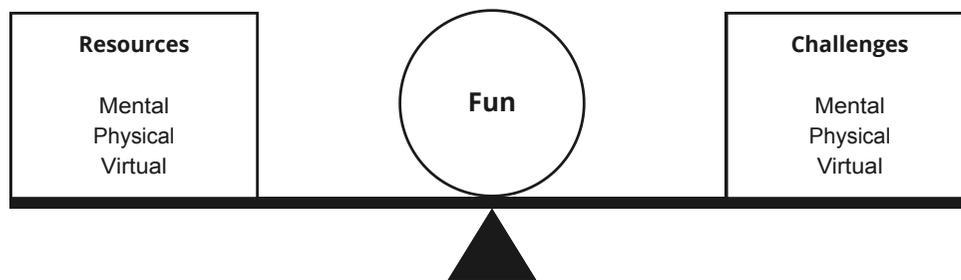
Jamie Madigan in *Getting Gamers* also describes why video games are appealing to us, based on a model by (Przyblski, A. et al. 2006, as cited in Madigan, J. 2016.) Jamie relates Self Determination Theory (SDT) to video games by describing the following aspects:

**Competence:** the feeling of doing well and getting better.

**Autonomy:** the satisfaction we feel when we make meaningful choices.

**Relatedness:** or feeling important to others.

These concepts are also visible in figure 1 as components of wellbeing. This project will focus on using both competence and autonomy. Another element that is core to this project is that of immersion, often referred to as embodiment (Madigan, 2016; Slater et al., 2019). Immersion, or spatial presence, is when a player's full mental focus is within the virtual space or world that is presented to them (Madigan, 2016). Immersion is a key aspect of game design that can be increased through a variety of game design methods. These methods include crafting highly detailed or realistic environments, designing complex and challenging gameplay, writing clever and engaging narratives and new technology platforms capable of rendering the high fidelity worlds (Madigan, 2016). If we look back at our definition of wellbeing (figure 3) then we apply it to the construction of a similar model for video games we can see a remarkable similarity (figure 9). By balancing both the players' resources with their challenges we can tilt the scales of fun. If the game is too challenging it becomes frustrating, if the player is highly skilled and has more resources available than the challenge of the game requires, it becomes boring and loses our attention. This careful balance, much like wellbeing, shifts and changes from player to player and from movement to moment so must be carefully considered when constructing a game.



**Figure 9**

*Definition of Fun in a Video Game*

*Note.* Based on figure 3 we can define 'Fun' in a video game by depicting the balancing of challenges and resources.



# MYSTERY AND MEANING IN MECHANICS

Wellbeing and happiness as previously discussed are inherently personal. There are elements to them that are subjective making them difficult to measure and assess (Dodge et al., 2012). Only you can tell others how you are feeling. Kahneman's system two or narrative brain is constantly at work trying to construct narratives about itself using any information that is to hand (Kahneman, 2013). System one has a model of the world that is maintained in associative memory, it immediately generates an idea of what was expected. System two then tries to find a reason for this surprise (Kahneman, 2013). This is true in video games and surprise makes things engaging and interesting (McGonigal, 2011). Writers and designers are well aware of this fact and are able to tell highly involving stories with minimal detail. *Journey* (Chen, 2012) is a video game that appears to be a simple game on the surface where the player embodies a simply designed character left to roam in a vast, open, desert world. The player 'journey' is through a large and mostly abandoned world full of spirit-like creatures and the ruins of an old civilisation. The mood is one of loneliness and curiosity, a search for answers and connection. There is no dialogue, only a few interactions with some hieroglyphic-like wall paintings.

Yet along the way the player occasionally and seamlessly interacts with other players. There is no way to communicate with the other player other than the basic directional movement and a call. This forms an inherently positive interaction with another player. Sometimes the interactions are short, other times the players stay together the entire game. Only at the end in which one player must choose who finishes the game are the players forced to separate. The emotional connection with the other player, the sense of loss of the world and themes of life and death are all expressed through simple interactions, environmental storytelling and a limited form of communication with the other player.

**Figure 10** (left top)

*Journey Environment*

*Note.* Screenshot from *Journey* showing the use of simple environments and character designs but a powerful sense of atmosphere and narrative.

**Figure 11** (left bottom)

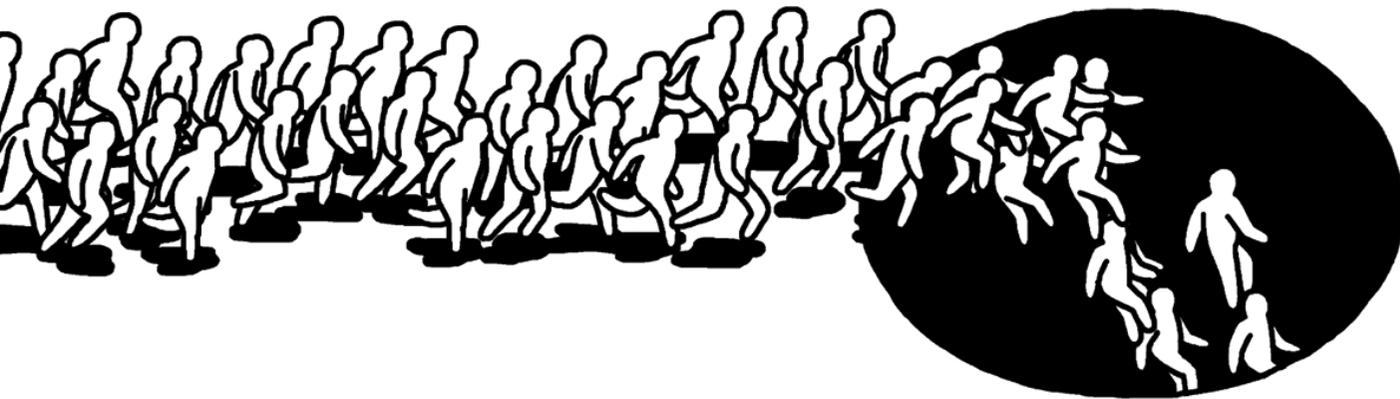
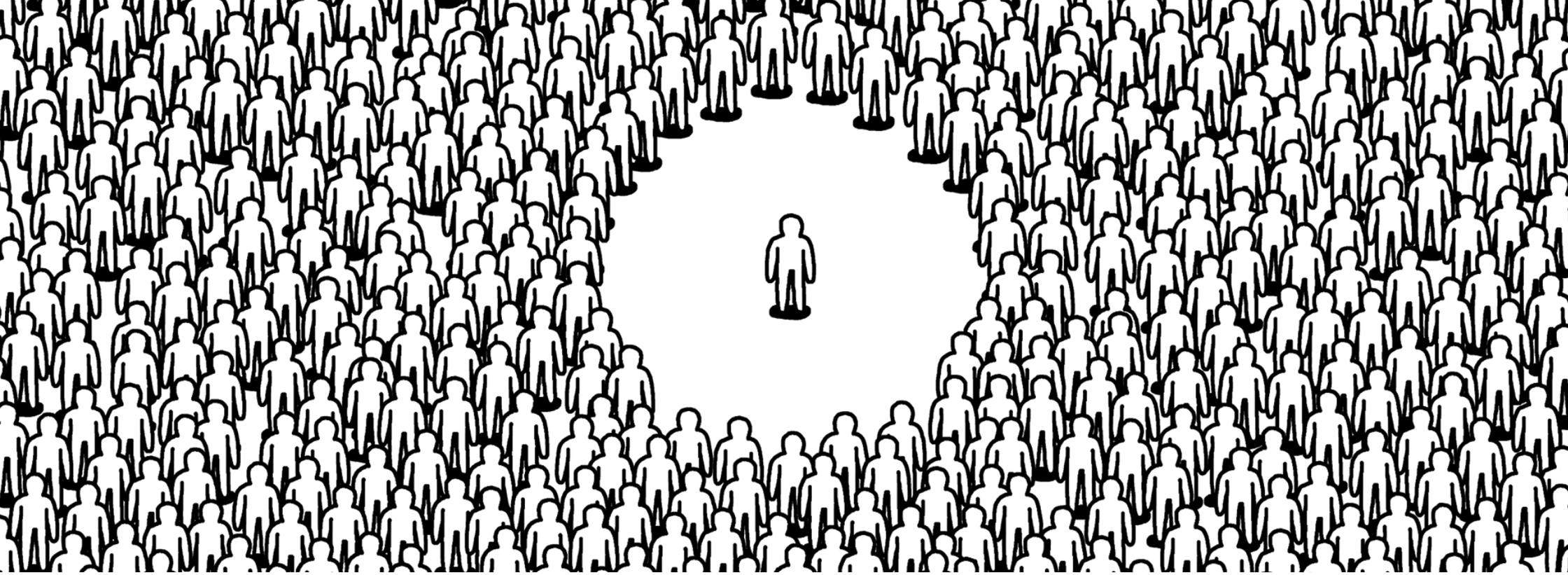
*Journey Multiplayer*

*Note.* A screenshot of two characters interacting in *Journey*. They can only communicate through movement or a simple call action.

*KIDS* (Richenbach & Frei, 2019) is another example of the use of minimalist design. *KIDS* is played on a tablet or a phone. The player is confronted with a screen full of small faceless figures who run onto the screen and stand around a hole. The player can then tap on the characters and they fall into the hole with a satisfying ptt sound (see figure 13). The rest of the game continues like this following themes around peer pressure, authority, rebellion and acceptance. None of these themes are explicitly mentioned and the blankness of the characters provide an empty canvas, only narrowed in a few scenes by their small amounts of dialogue that are voiced by children. The simplistic gameplay (the player can only interact by tapping or dragging) combined with the canvas-like nature of the environment and characters, open the possibility to many meanings as interpreted by the player.

“Even if the game doesn’t present players with every little detail of the world, they will draw from their own stores of knowledge to increase the vividness of the mental model.” (Madigan, 2016, p. 142)

So while the overarching themes of *Journey* and *KIDS* are aesthetically different the visual and storytelling language is similar. Their open-ended nature of the interaction and the ambiguity of the story and world provide a strong foundation for the players to craft their own narrative onto what the meaning of their avatar’s (player character) journey was. The use of minimalist design elements and dialogue help give the most room for players to project their own experiences and emotions onto the characters, to give a meaningful and personal story. They also allow the user to engage with ideas and themes that might be challenging or upsetting, but the engagement is free, it can be stopped at any point. This is a key element of play, and something that sets it apart from a treatment or education (Tekinbaş & Zimmerman, 2003). We can look at both *Journey* and *KIDS* in terms of Tekinbaş & Zimmerman’s (2003) definition of a game. The systems that are involved in *Journey* are simply moving the character around the screen and collecting certain objects. The conflict is formed through the discovery of hidden scarf collectables in the case of *Journey* or discovering what use of touch control is required to progress in terms of *KIDS*. The sense of competence and autonomy in Madigan’s (2016) SDT come from the satisfaction of discovery of hidden items, navigation through the environment or of understanding how the gameplay mechanic works. These puzzle games provide an example of simple gameplay mechanics that can be discovered through exploration in order to provide satisfying results.



**Figure 12** (top)  
*KIDS Screenshot 1*  
Note. Screenshot from *KIDS* showing the repeated use of simple characters, composed to create highly emotive imagery and gameplay.

**Figure 13** (bottom)  
*KIDS Screenshot 2*  
Note. This screenshot requires the player to tap on the hole in order for the characters to jump down.

# VIRTUAL REALITY

Ultimately with game design the goal is for the player to have an experience where they are taken to another world, another key aspect of play. The player should be involved and engaged within the world and this world will be inherently virtual: a new reality. Virtual reality (VR) is a tool and platform capable of delivering highly engaging, interactive and immersive experiences. VR involves the use of a head mounted display (HMD), which is tracked in 3D space and rendered at a significantly high enough refresh rate to avoid latency and to give sufficient persistence of motion. This is usually accompanied with controllers that are also tracked for a 1:1 representation of physical movement within a virtual space. Because of the fidelity of tracking, virtual reality when combined with the appropriate content, has a high level of immersion as it is able to trick some of the vestibular systems into thinking the virtual world is real (Madigan, 2016). VR has been used as a method for exposure therapy or self dialogue therapy and provides an advantage over other mediums (Slater et al., 2019). Narrative theories emphasise the potential for VR as a unique storytelling medium (Aylett & Louchart, 2003). If the goal is to create an immersive and mysterious place then VR provides a solid platform for just that. VR also provides a platform where the interactions become very intuitive. Once players realise they can reach out and ‘touch’ elements they do so in a very natural way, much like in the real world.

This intuitive interaction is the cause of many of Kahneman’s heuristics and biases that system one uses in order to make quick decisions (Kahneman, 2013). We can take advantage of the fact that many players will assume the mechanics inside the virtual world will work in the same way as in the real world. The manipulation of these assumptions allows for surprise and mystery which can help keep gameplay interesting. The platform of VR can help to allow immersive and intuitive interactions in the creation of a puzzle game that focuses on exploring key aspects of video games that are associated with positive aspects of wellbeing. Fiero, flow, competence, and autonomy are all important components that will be focused on following the structure outlined by (Tekinbaş & Zimmerman, 2003). By looking at existing examples such as *Journey* and *KIDS* we can combine elements of these games that specifically focus on wellbeing, rather than narrative, and shift them into VR to create a more immersive experience, enhancing the mechanics that already exist. The success of using an abstract style with room for player interpretation has been demonstrated already but a further look at different aesthetics and forms of abstraction can help define the look of the game.

“Interactivity is vital to creating spatial presence in video games. The more things you can interact with in a predictable way, the easier it is to create that mental model. Perhaps more importantly, the easier it is for your mind to fall into the habit of assuming that the game world is your primary point of reference for your location—the very definition of spatial presence.” (Madigan, 2016, p. 140)

# VISUAL SURREALISM, SYMBOLISM AND ABSTRACTION

During the search for an aesthetic for this project two exhibitions, the Surrealist exhibition at Te Papa and Hilma af Klint at Wellington City Art Gallery. Both had a strong influence on the direction of my work as they managed to clarify how to successfully work with the sense of the undefined elements of mystery, further reinforcing ideas from Khaneman and Madigan interpretation and meaning. Hilma af Klint's work, was some of the earliest examples of abstraction in modern fine art, the work provides some pure examples of translating complex concepts into basic geometric shapes. Her work series in figure 14 and 15 show the process of abstraction of realistic shapes into abstract cubes and representations of light (Bashkoff, 2018).

Hilma af Klint's interests lay in human spiritual elements and contemporary scientific advances such as spectroscopy and radiation (*Secondary Study Guide Hilma Af Klint: The Secret Paintings, 2022*). This mixture of the spiritual and scientific helps to create an interesting aesthetic and draws parallels to *Te Wheke* (figure 2), with its mix of spiritual, mental and scientific aspects. Klint's work was groundbreaking that she believed it was so forward looking that it needed to be hidden from the world, to be revealed after 50 years (*Secondary Study Guide Hilma Af Klint: The Secret Paintings, 2022*). This allowed others to forge own parallel paths into this new language of abstraction.



**Figure 14**

*The Swan No. 1.*

Note. We can see Hilma af Klint's first in the *Swan* series exploring the dualities of life and death, male and female and light and darkness. By Hilma af Klint, (1915) [Painting].



**Figure 15**

*The Swan No. 8.*

Note. In this painting we can see the almost complete abstraction of the swans into cubes and beams of light. By Hilma af Klint, (1915) [Painting].

The use of simple geometric shapes can have instinctual results, with our minds (system one) wired to quickly analyse and assess threats (Larson et al., 2007). Larson et al., demonstrated subjects were much quicker to respond to downward triangles rather than circles as they are a more threatening shape, which was theorised to be associated with the eyebrows of a face. While studies like these were not available at the time, the instinctual responses of the viewer to geometric shapes was noticed by artists such as Klint. Her use of triangles, squares and circles to represent ideas such as ascension, the body and the eternal respectively were paralleled and developed by future artists (Meggs et al., 2006; *Secondary Study Guide Hilma Af Klint: The Secret Paintings*, 2022).

Many of these artists were involved in the early 20th century art movements. These were characterised by strong and clearly defined goals as reactions to challenges in their society through highly explicit manifestos that incited change (Puchner, 2006). The surrealists' interest in the subconscious, dreams, symbolic visual language and repeated use of motifs were used as a new way to explore the human condition (Meggs et al., 2006).

“They sought ways to make new truths, to reveal the language of the soul ... it was a way of thinking and knowing, a way of feeling, and a way of life” (Meggs et al., 2006, p. 262)

Symbolism can provide a layer of meaning to elements that can be interpreted in subtly different ways, much like wellbeing itself. Works such as Giorgio de Chirico's *The Enigma of a Day* (figure 16) has a sense of unease with its crisp rendering of a strangely empty city environment and harsh lighting. Figure 17 by René Magritte depicts an eye with an iris acting like a window into a cloudy blue sky.



**Figure 16.**  
*The Enigma of a Day*  
Note. The strange placement of elements in this scene draws the eye and the mind to questioning the intention. By Giorgio de Chirico, (1914) [Painting].



**Figure 17.**  
*False Mirror*  
Note. René Margitte's use of clouds in the iris of an eye is a typical example of juxtaposition used by the surrealists. By René Magritte, (1929) [Painting].

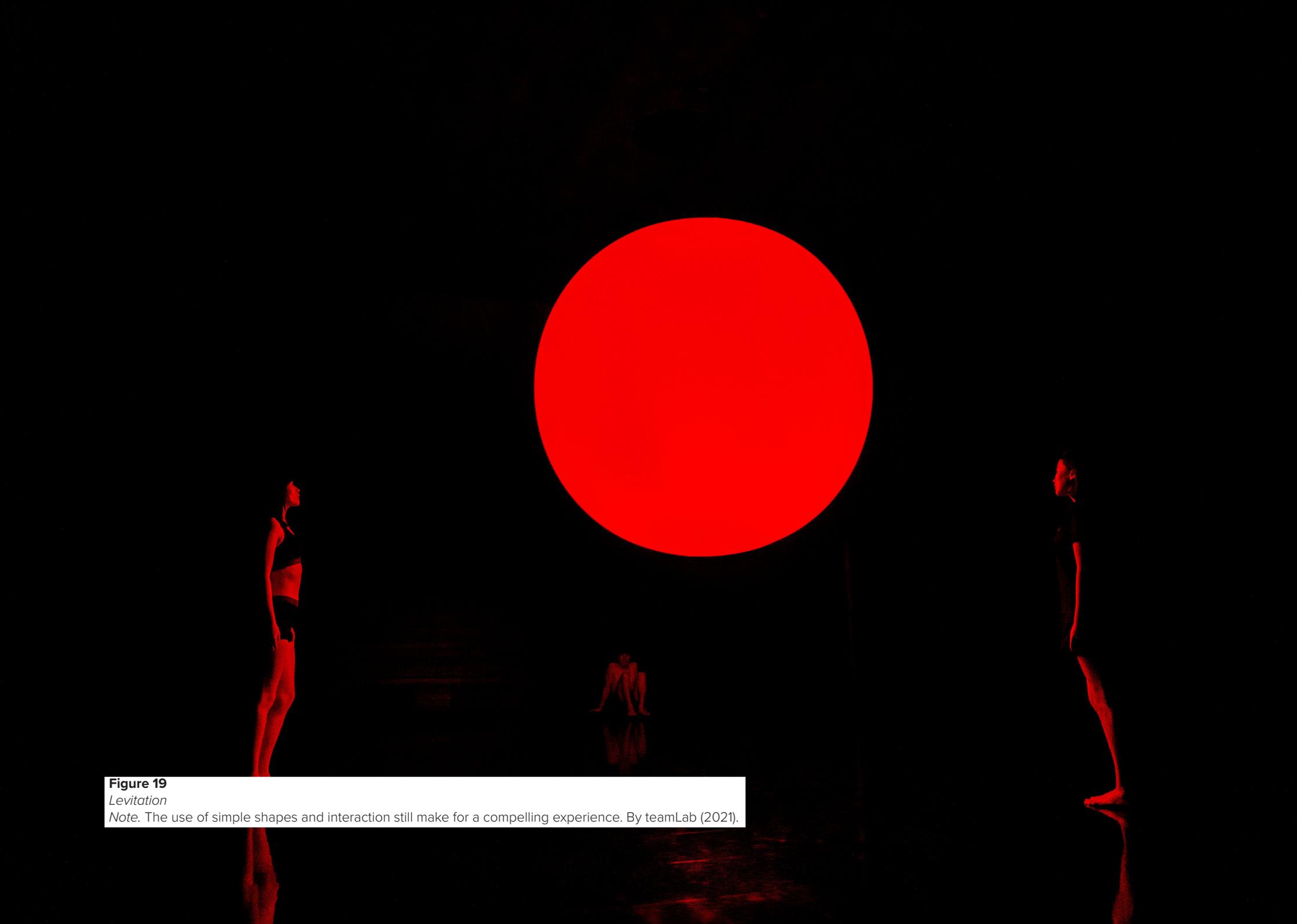


**Figure 18**

*External Installations*

Note. A screenshot from a computer generated video by Andreas Wannersedt (2020) that shows the use of simple geometric shapes in surreal natural environments. The movement of the objects is smooth and satisfying.

The use of statues or other carefully placed, yet distinctly strange, elements immediately draw the eye, and the mind, to try to understand the narrative of the piece. This juxtaposition of the elements out of context refers back to confronting the heuristics of Kahneman's system one, short circuiting our usual assumptions about the world that surrealists depict and engaging system two in constructing a narrative (Kahneman, 2013). A contemporary example, such as the 3D short video animation *External Installations* by Andreas Wannersedt (2020) (figure 18), have a similar tone to the surrealists work. The use of strong realistic lighting and the placement of simple 3D primitives in natural, yet sterile, environments are combined with simple and satisfying physical movements to give a strange and immensely satisfying feeling. The use of colour and placement of objects outside of their normal contexts invites us to engage system two.



**Figure 19**

*Levitation*

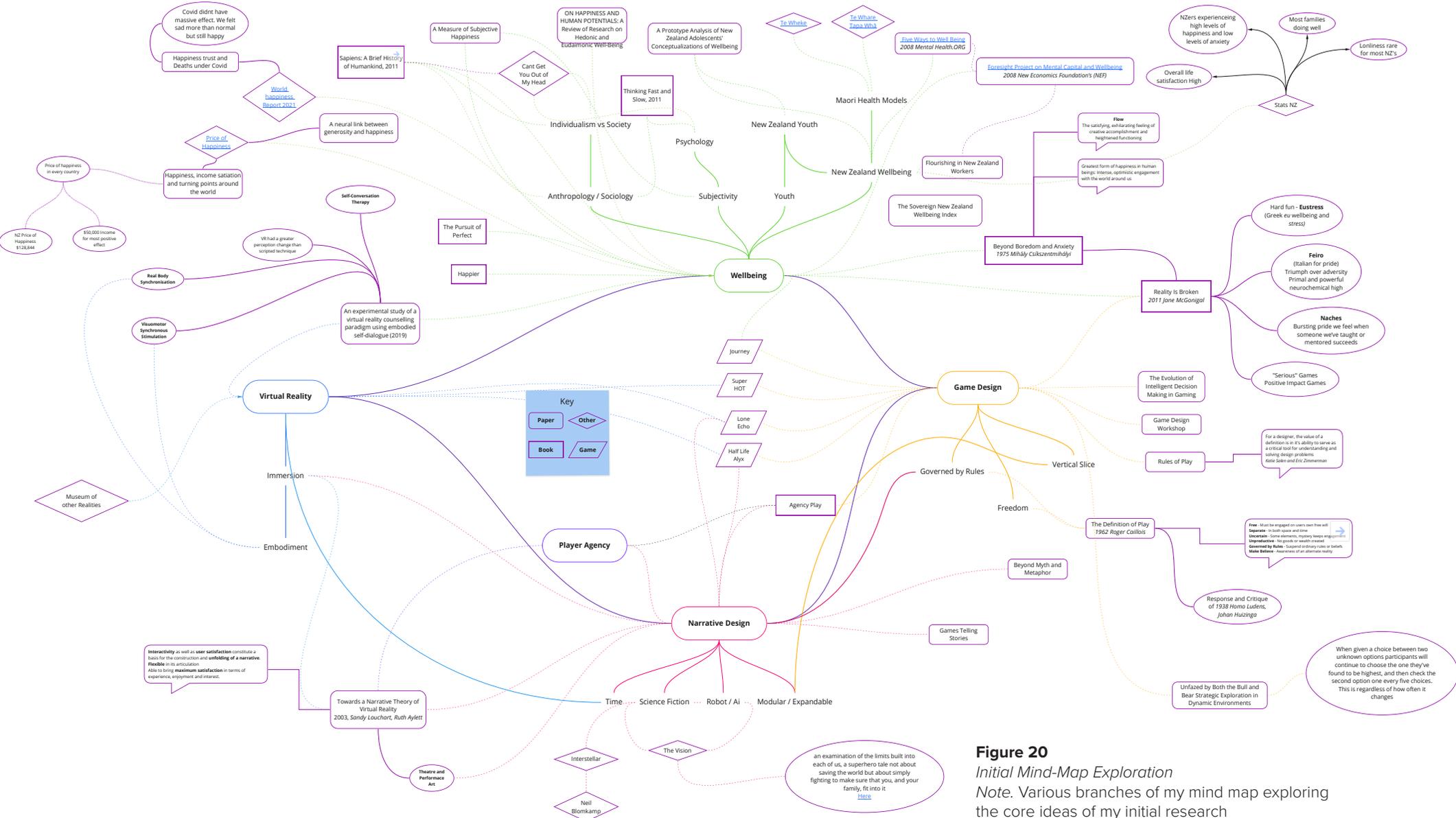
*Note.* The use of simple shapes and interaction still make for a compelling experience. By teamLab (2021).

teamLab brings this language of abstraction and symbolism to the medium of interactive design. teamLab is an international collection of artists that provide interactive experiences exploring “art, science, technology and the natural world” (*teamLab*, 2021, para 1.). Their incredibly simple and appealing aesthetic is enhanced through advanced interactive technology. This simplicity removes any barriers for engagement and allows for a wide audience. Many involve touch, sound and light, packaged in a simple and clean aesthetic, often with the use of water and mirrors that gives the environment the illusion of infinity. The result is an almost ethereal or other-worldly atmosphere present in these installations.

The work *Levitation* (figure 19) is an installation that takes place in a darkened room. Participants pass a giant inflated ball that seems to float in front of them, emitting a soft glow of a slowly changing colour. While this interaction may appear rather simple, according to the artists, the work involves an exploration of life, entropy, “Supernature Phenomenons”(*teamLab*, 2021, para. 1) and explores changing cognition (*teamLab*, 2021). Once again we see a platform for the engagement of system two, yet this time combined with elements of wellbeing. The work is presented in a communal environment, and the audience is encouraged to take notice of details and be physically engaged. These relate to three of the five elements of the *Five Ways to Wellbeing* (*Five Ways to Wellbeing*, 2009). There is an element of mystery, as to understanding the hidden function of the piece which when combined with play and placed within the context of a gallery invites the audience member to draw more meaning and intention from the work than perhaps they would be, were these elements separated. Research shows that viewing art in a public space can reduce feelings of anxiety in viewers and improve overall wellbeing (Binnie, 2010).

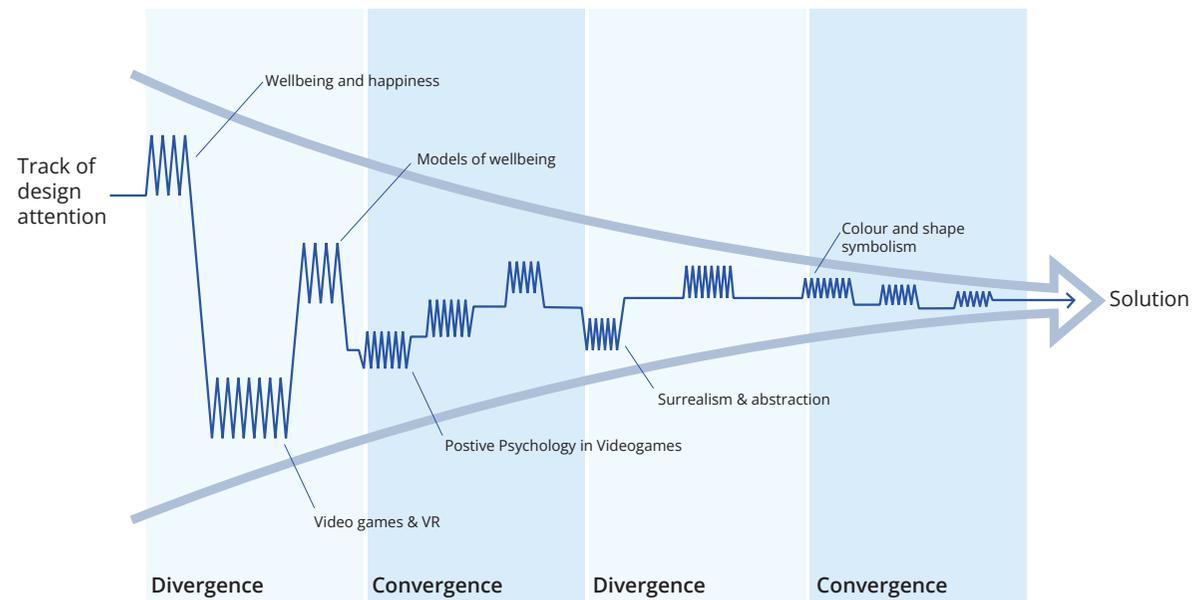
What is appealing about all of these examples is they provide a simple and clean aesthetic that is intuitively readable. The viewer can experience the work without having to learn a new visual language. Yet they all have layers of meaning through which the viewer descends. The use of simple geometric shapes, abstraction of complex ideas, the juxtaposing of strange objects or the use of bold colours - all of these elements combine with simple and intuitive interactions to provide a solid aesthetic foundation from which we can begin to build the prototype game.

# DESIGN JOURNEY AND METHODOLOGY



**Figure 20**  
*Initial Mind-Map Exploration*  
 Note. Various branches of my mind map exploring the core ideas of my initial research

Throughout this MDes I have used a variety of methods and techniques. Miro was used to quickly map ideas and concepts, collate my sources, develop mind maps and diagrams, and also for visual research and presentations. Mind maps such as figure 20, helped to connect core themes and ideas to relevant sources. My initial research explored the four pillars of: happiness, virtual reality, game design and narrative design. My method was adapted from the convergent design model described by Nigel Cross (Dubberly, 2008) and can be seen in figure 21. This model describes a series of divergent paths taken, such as those of wellbeing and video game design. These slowly converge on a target solution or common goal. A significant divergence emerged when looking into the surrealists, early 20th century art movements and more abstract interaction design such as *teamLab* while trying to pin down an aesthetic. An exploration of their design methods led to trying to integrate some of the wellbeing models in a more abstract method, with shape and colour being used to represent emotions or other ideas of wellbeing. It also gave me a foundation for building a visual aesthetic.



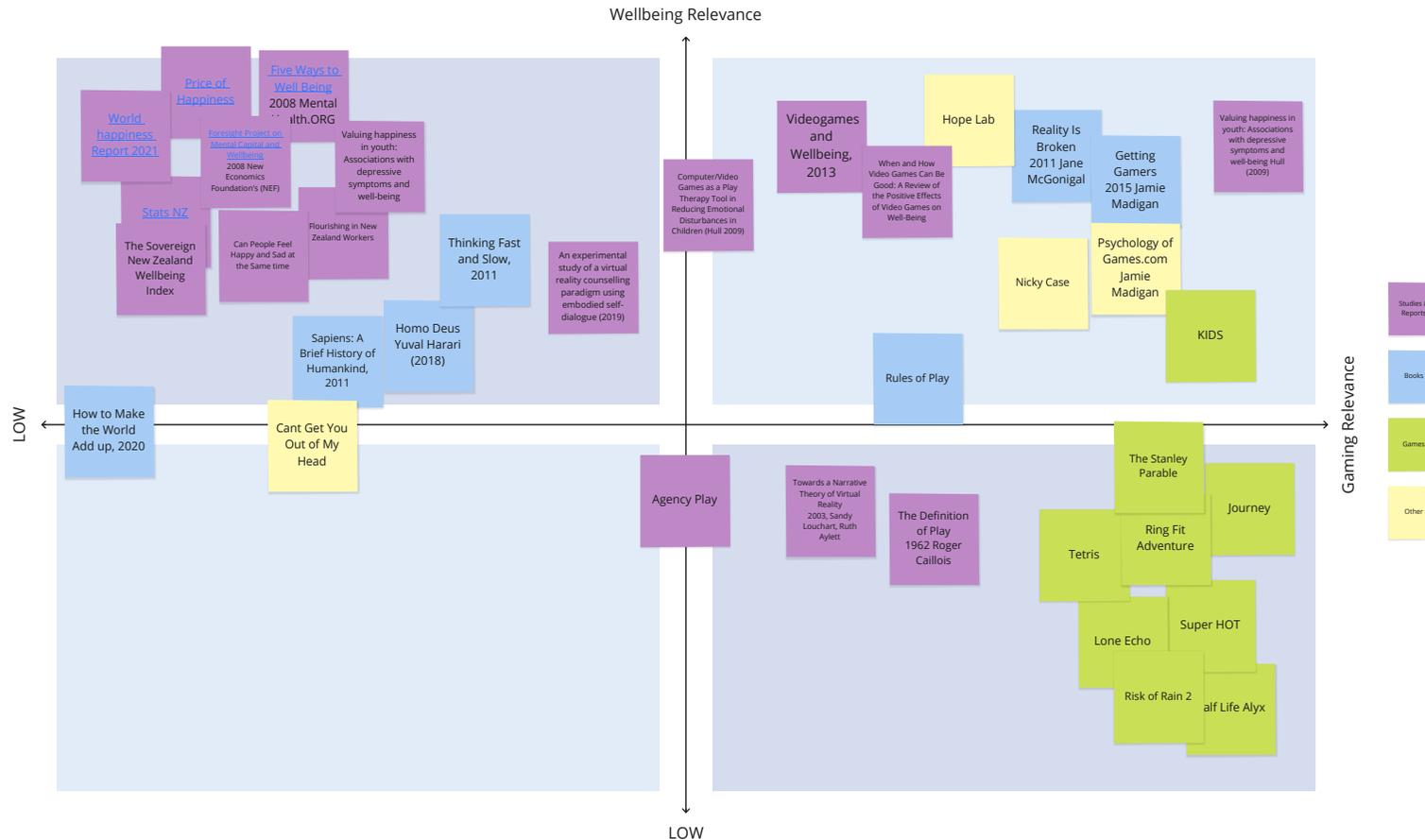
**Figure 21**

*Convergent Design Process*

Note. Convergent design model indicating some of the key divergences during my design process.

Adapted from Nigel Cross's *Convergent Design* (Dubberly, 2008).

I used mind mapping, language mapping and moodboards to explore design ideas. Figure 22 shows a resource axis map identifying areas that needed more research. Figure 23 demonstrates how I visually link ideas around the *Five Ways to Wellbeing*. This was a crucial starting point for the game design as it framed the environment and a theme for each section, which informs my practical design.



**Figure 22**  
Wellbeing and Gaming Axis Map

Note. An axis map created in order to gauge the relevance of my resources. This helped identify the need for more cross-over resources.



Collection of particles, elements, birds, drones, fish

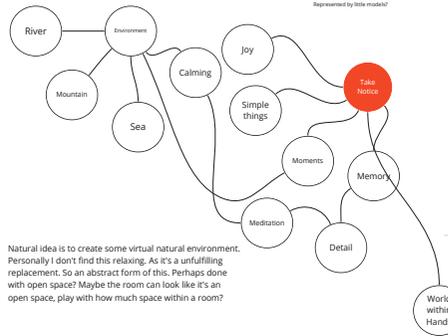
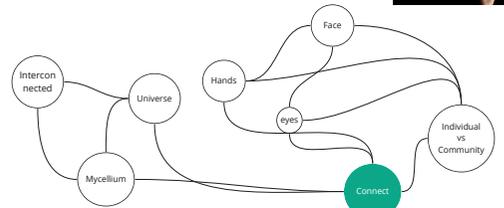
Just keep going

Open reflective space. Into infinity. Like the mind

Art galleries

Natural idea is to create some virtual natural environment. Personally I don't find this relaxing. As it's an unfulfilling replacement. So an abstract form of this. Perhaps done with open space? Maybe the room can look like it's an open space, play with how much space within a room?

Little worlds and play?



**FIVE WAYS TO WELLBEING**  
 INTRODUCE THESE FIVE SIMPLE STRATEGIES INTO YOUR LIFE & YOU WILL FEEL THE BENEFITS

**CONNECT**  
 TALK & LISTEN. BE THERE. FEEL CONNECTED

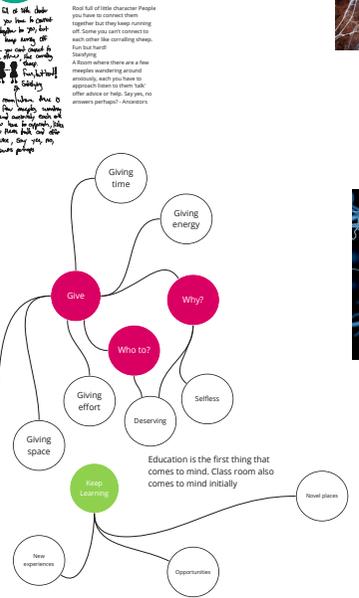
**BE ACTIVE**  
 DO WHAT YOU CAN EVERY DAY YOU DO. MOVE YOUR BODY

**TAKE NOTICE**  
 REAPPEAR THE SIMPLER THINGS THAT GIVE YOU JOY

**GIVE**  
 YOUR TIME, YOUR VOICE, YOUR PRESENCE

**KEEP LEARNING**  
 EMERGE NEW EXPERIENCES. SEE OPPORTUNITIES. SURPRISE YOURSELF

Mental Health Foundation



colour vs greyscale



Connection through eyes, facial expressions. What happens if only eyes?

Human society, vast interconnected web

Give energy like draining life (negative)

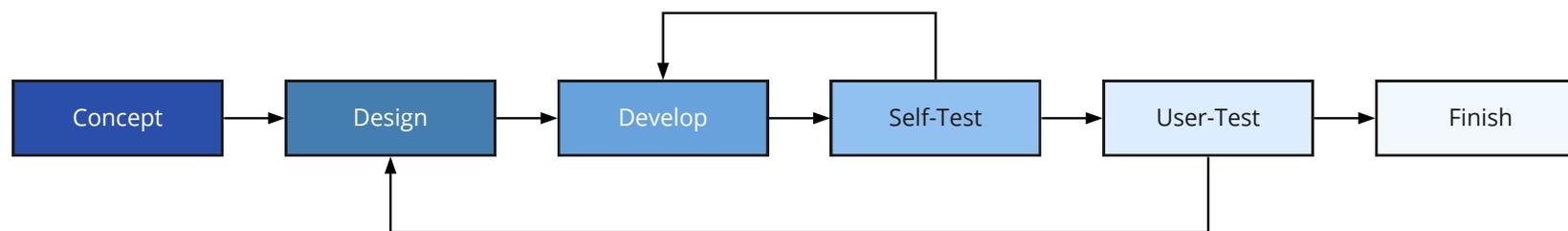
Give time and thought.

Meditation and connection with universe

**Figure 23**  
 Five Ways to Wellbeing Room Moodboard  
 Note. My visual exploration for rooms and ideas based on the Five ways to Wellbeing. You can see the beginnings of the eyes in the top right, and the use of swarms or flocks in the top left, both of which feature in the final design.

# SOFTWARE DEVELOPMENT

Another element working in parallel with my theory research was practice based exploration into the programming language required for Unreal Engine and VR development. Alan Cooper's (Dubberly, 2008) (see figure 24) description of the evolution of software design has many parallels with how I ended up working throughout the project. Each game concept had to be developed, designed, coded and tested. Issues are inherent in this process and workarounds were needed as many features or methods are constrained by what functionality is available - either due to coding skill or engine restrictions. There are also many unforeseen elements that appear because of the overlapping of systems or coded mechanics that can interact in ways which are unpredictable. Sometimes this can be positive and create some unique outcomes where interactions or systems interact in unpredictable, yet appropriate ways, an example of this was the Blue Room (see figure 37) where the cubes connect but then fly apart from each other is technically a bug, but was dynamic and appropriate. Most often however, they were bugs that broke functionality. The core loop of 'Design - Develop - Test' would happen very rapidly over sometimes very small features. With the design slowly expanding due to my knowledge of the engine or insight into what was possible for my skill level.



**Figure 24**

*Game Development Process*

*Note.* My game development method, develop and self test took place within Unreal Engine using the blueprint system, this step was the most time consuming. Based on *Software Development Model* by Alan Cooper (Dubberly, 2008).

Game design is about creating systems and allowing the player to explore these systems. Game engines and coded systems can behave in ways that are unpredictable, especially as more mechanics or components are added. This adds layers of testing that take time to test and refine. I limited complexity within my game to a few simple functioning systems. The largest design challenge in this process was exploring and learning the tools of game design. I've always been a rather technical designer with a focus on systems, programs and technology so I am familiar with the overall process of defining the steps involved but this was still a challenge. Processes such as character design, rigging, keyframe animation, texturing, lighting were all deliberately avoided in order to prioritise the development of a functioning prototype.

The virtual reality setup I used can be seen in figure 25. The primary element is the Head Mounted Display (HMD), with two panels that provide a 3D image. The HMD is tracked by an external laser grid created by two IR emitters or 'Lighthouses'. For this research I used the maximum space allowed by the HTC Vive of 3.7m x 3.7m, the setup is called 'Room-scale'. The HMD is accompanied by two 'wand' controllers that feature a trigger, two side buttons, a touch pad and two menu buttons. These are also tracked with the laser grid and internal accelerometers. This form of 'outside-in' tracking is the most accurate with the downside of it being the least accessible requiring calibration and setup. By contrast other headsets use camera based 'inside-out' tracking systems that use a series of cameras to track external objects as reference points for the headset. These are more easy to use, but lack accuracy with tracking, say if the controllers move outside the headsets field of view. I chose the HTC Vive due to the tracking accuracy, as well as access to the equipment and familiarity with the platform. The software is managed by Steam VR which runs on a PC.



**Figure 25**  
*HTC Vive*  
Note. A depiction of the VR HMD that will be used for this project

VR adds an entirely different set of challenges compared to traditional 3D game design. Some of these I was familiar with through my experience with VR games and listening to designer interviews regarding the challenges in designing them (Valve, 2020). The primary challenge is player movement. Because the player's view is directly tied to their head, if the world moves without their feet moving then it can become extremely disorientating and induce motion sickness. The most common solution to this is to add a teleporting mechanic, where the player uses their hand controller to teleport their player character to a new area. This works reasonably well but adds an abstract layer on top of their experience that can detract from the believability or immersion of the experience. Alternate solutions are walking systems where the player swings their arms, traditional 'sliding' for those with stronger stomachs, or restricting the player to their real world play area. From the outset I wanted to avoid the more artificial methods and stick with room-scale where the player can only move within their real world area as it provides the most accessible and natural form of VR interaction, it also encourages moving around and physical activity, a pillar of wellbeing, and VR is often encouraged to be used to be an exercise tool (Dingman, 2022). I will still have to have a representation of the room-scale boundaries within the game for safety and practical reasons, but these will be seen relatively infrequently as they only appear if the player is close to the edge.

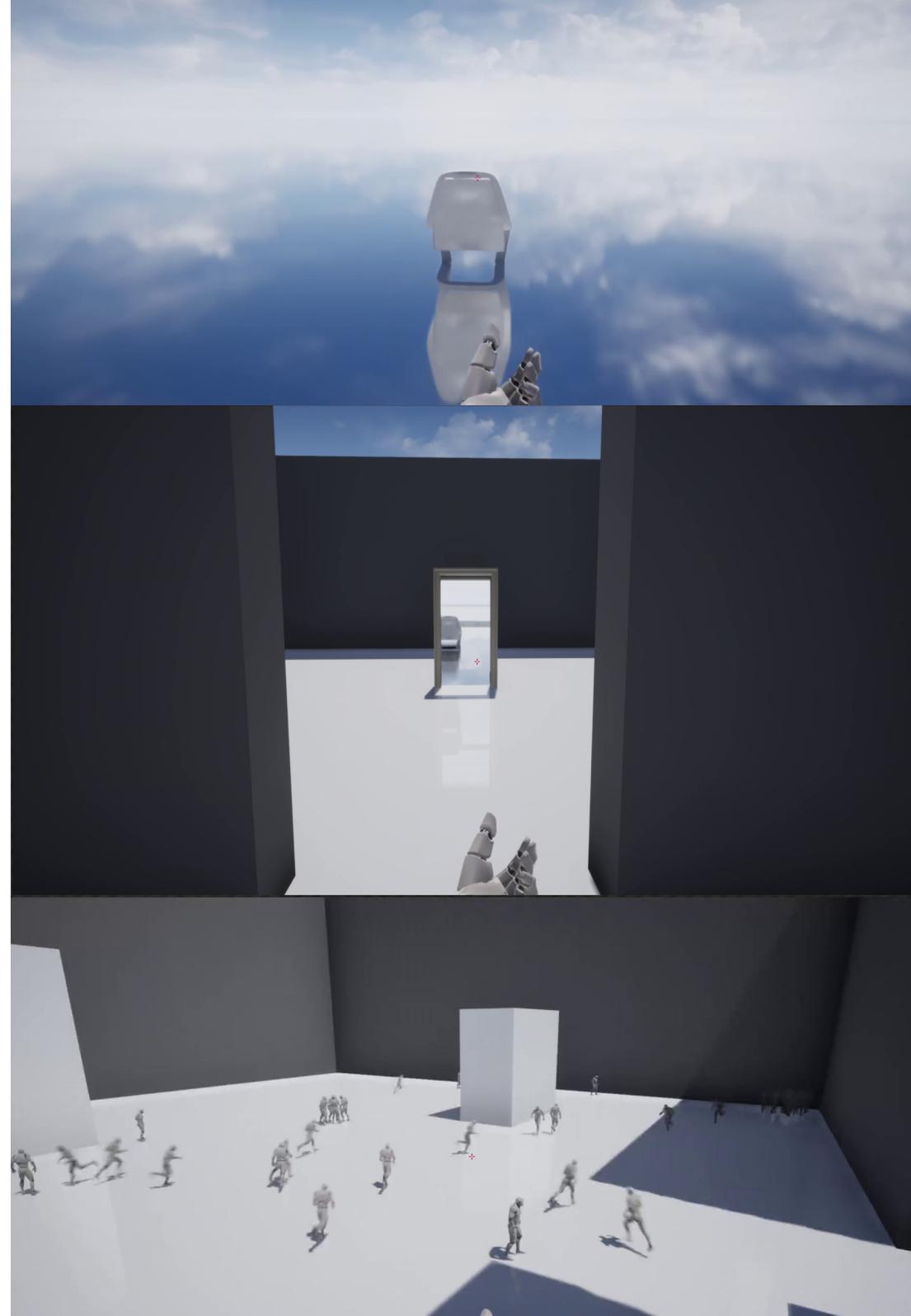
# GAMEPLAY DESIGN

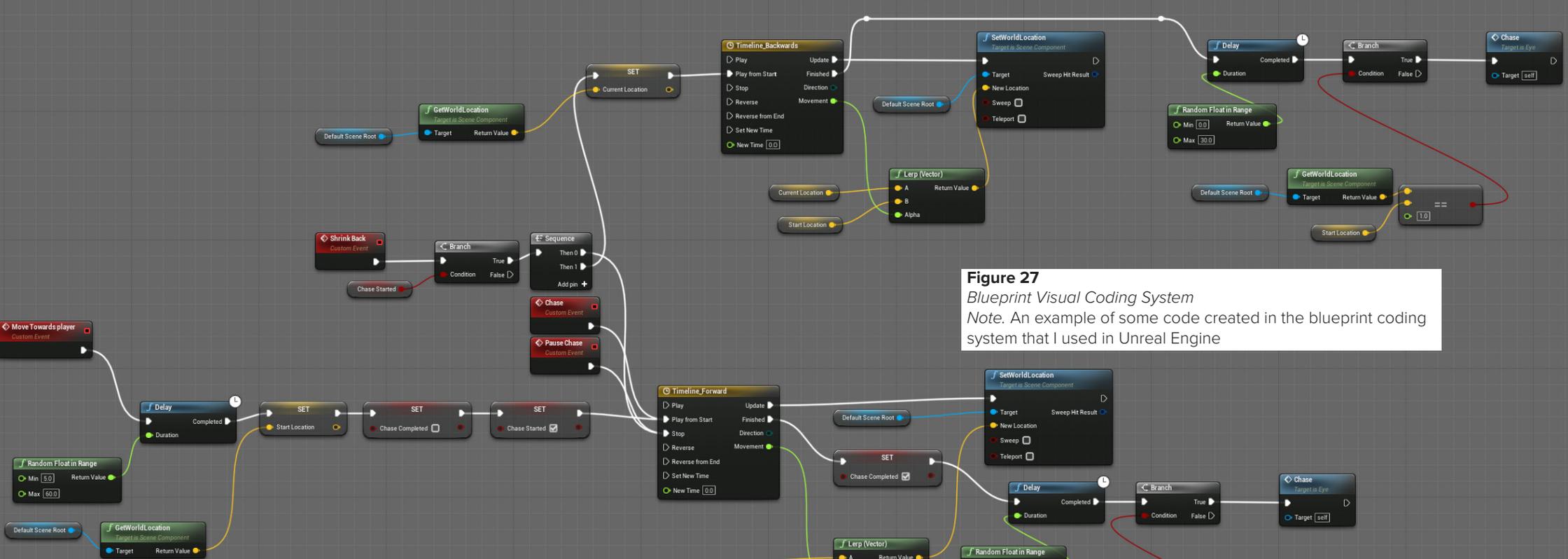
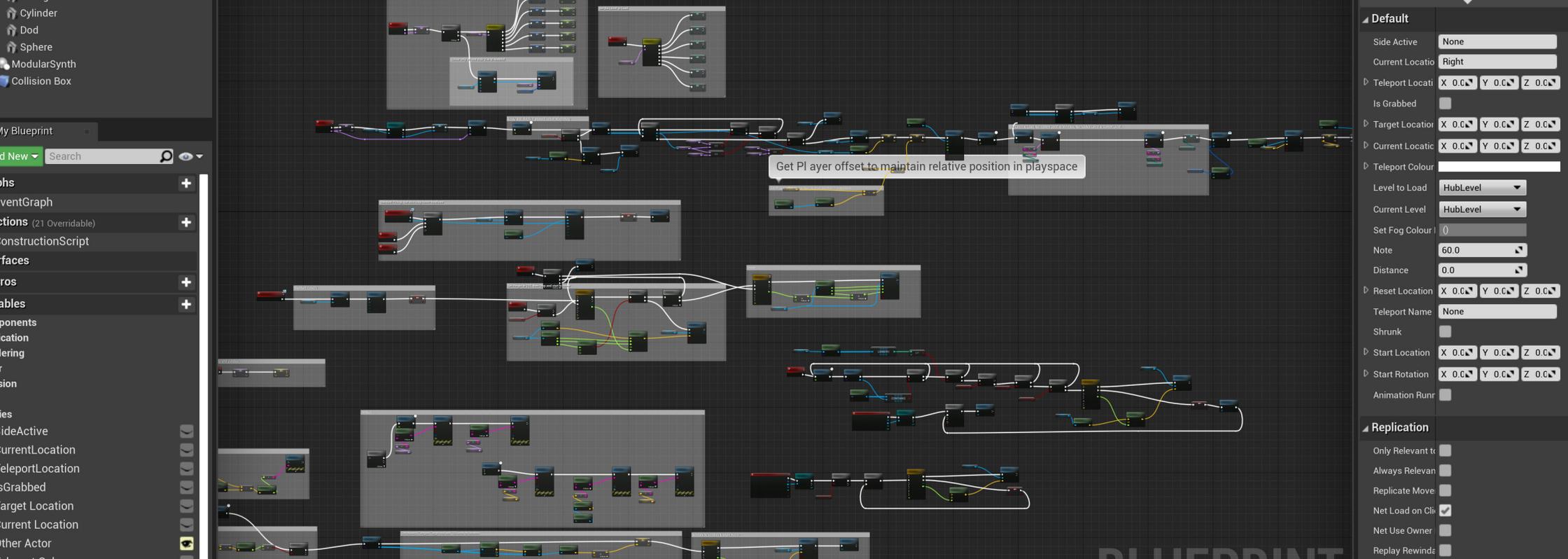
Initial experiments in Unreal Engine were developed by following tutorials and early prototypes with AI. Non-euclidean geometry, where the player would seamlessly and quickly teleport to a different environment showed potential for a convincing manipulation of players expectations. The AI experiments involved small logic chains and had human-like characters following or running away from the player. Changing the scale of the player quickly changed the 'feel' of the AI. Another observation was how quickly there was a natural assumption of intent put on the AI. The most valuable insights here were practical examples of core concepts demonstrated for Unreal Engine which helped familiarise me with the blueprint system or the chosen visual coding language of Unreal Engine (see figure 27).

## Figure 26

### *Early Unreal Engine Experiments*

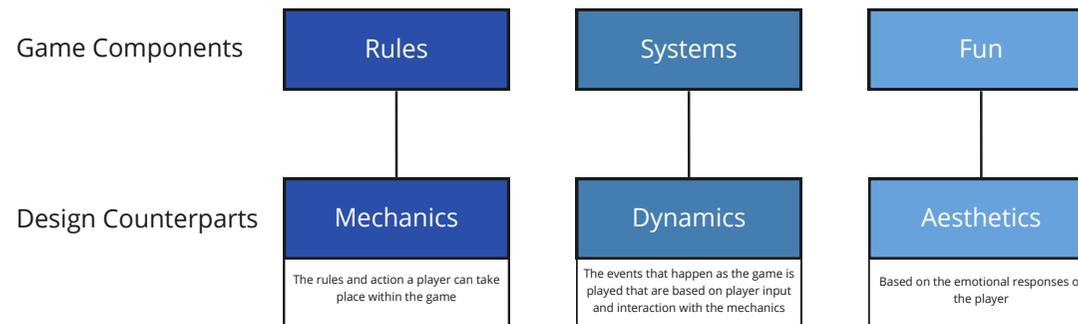
*Note.* Early experiments using a first person game mode and the default Unreal Engine character model.





**Figure 27**  
 Blueprint Visual Coding System  
 Note. An example of some code created in the blueprint coding system that I used in Unreal Engine

The game mechanics were initially based on one of the *Five Ways to Wellbeing*. A framework used to explore further game design was the MDA Framework (MDA) that separates game components into their design counterparts as seen in figure 28 (Hunicke et al., 2004). These are similar to the systems, rules and conflicts described in Tekinbaş & Zimmerman’s model (2003), but helped me to simplify my design thinking. The insight into what I want the player to feel was very helpful.

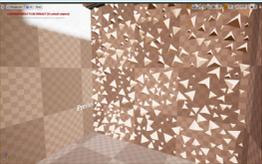
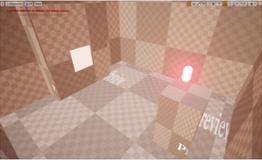
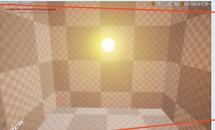
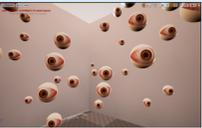


**Figure 28**

*MDA Framework*

*Note.* The relationship of the game components to their design counterparts as demonstrated in the MDA Framework.

The table in figure 29 depicts an early version of what was intended to happen in each room, what emotion I’m targeting, how it can relate to wellbeing and any bugs or features that need to be added. I would update this chart as I progressed. I kept the interaction mechanics very simple and intuitive. They involved touch, grab, throw, look or move. These are also mechanics that are quite natural within VR as your controllers are represented with hands. The dynamics is where the design process became more difficult. What to touch, where to throw and where to put something had to be intuitive enough that people could figure it out on their own, but unexpected enough to be surprising or interesting. Bug and feature tracking was done through the Kanban framework (Anderson, 2010) on Miro. This was helpful in terms of focus, as later in the project bugs and stability control became harder to maintain. It was a little difficult as some of the elements or tasks required significantly more time than others, which was something that isn’t necessarily apparent until you begin that task.

	PICTURE	DESCRIPTION	FEATURE	ARTISTIC RATIONALE	WELLBEING RESEARCH	
	Visual indication of what it looks like	Description of interactions	Goals or targets for the room, each room needs feeling, interaction, motivation	Rationale / description for interactions		
<b>STARTING ROOM</b>		<p>This is the initial starting area. It is set to the exact size of the maximum play area of 3.5 x 3.5m. This is so the player needs no motion control and moves purely with their legs. There are buttons on 5 of the pillars that take the player to a room where they are placed in the same relative location as they teleported. This room is for the player to start and return too.</p> <p>The base floor is there for reference but being in an infinite space with the sun gives a surreal feeling. I think there needs to be some detail or else it becomes too fake</p>	<p>The only game mechanic is touching the buttons to teleport. Perhaps there needs to be some thing to indicate that although I don't think that it will take long for people to notice.</p> <p>Need to introduce hands and show they are physical.</p> <ul style="list-style-type: none"> <li>Needs sound</li> <li>New hands</li> <li>Horizon detailing</li> </ul>	<p><b>Figure 29</b> Room Breakdown Table. <i>Note.</i> Each column shows the different aspects of each room, describing the feeling, colours, relation to wellbeing and mechanics.</p>		
<b>TRIANGLES</b>		<p>A small room with many triangles. As the player touches them they grow slowly and make a crackling ice sounds. The triangle that is touched turns glowing blue, as do the triangles within a small radius.</p> <p>Once a certain amount of triangles are touched then an element spawns in the center of the room</p>	<p><b>Feeling</b> - Tension, tactile, release</p> <p><b>Interaction</b> - Touching the triangles to stop them encroaching on the middle</p> <p><b>Motivation</b> - The triangles begin to move by themselves</p> <p>Touch and sound. I think this room needs to explore the physical nature of the triangles and have them be more threatening. As they get bigger they can approach something (balloon in the middle?)</p> <p>Instigation can be that the triangles are getting bigger over time and as touched they slow down</p>		<p><i>Action is crucial, without it the world continues without us. Even a simple action, such as touch, can have a profound effect on another. Will you act in time?</i></p>	<p>Be active, a crucial part of wellbeing, being physical, but also putting yourself out in the community and being proactive about your environment. Can definitely be harder if someone struggling with mental health</p>
<b>CAPSULE</b>		<p>Capsule room with a single capsule hovering in midair. This can then be picked up and once it is then it starts to spawn more with a popping noise. These fall onto the ground as physics objects.</p> <p>They can then be placed inside the small door on the side which automatically opens when something is near it. It then closes and deletes the items inside</p>	<p><b>Feeling</b> - Curiosity, give.</p> <p><b>Interaction</b> - Give the capsules somewhere...?</p> <p><b>Motivation</b> -</p>		<p><i>Sometimes we have plenty, there are other times when we are lacking. In times of plenty it is important to give. Time, energy or attention. Just a little.</i></p>	<p>Giving time and attention to others, not only boosts your wellbeing but also others. Being selfless has benefits all around. Even if it is done for selfish reasons it can still benefit both parties</p>
<b>SQUARE</b>		<p>This room is spawned with floating squares (instanced to rocks atm but easy to change). Once the player touches them they begin to float with physics (no gravity) They then bounce into each other setting off each others physics. They also play a sound when they are hit and change colour.</p> <p>There is currently no goal</p>	<p><b>Feeling</b> - Connection.</p> <p><b>Interaction</b> - Pick up two squares and make them touch. This connects to other squares and they change colour</p> <p><b>Motivation</b> - Each square will do it once it bumps into another</p>		<p><i>Every instant there are an infinite set of possible interactions. It only takes one moment to spark a chain of unending connections.</i></p>	<p>Connection with others can be hard to achieve, but little actions can go a long way. People tend to reciprocate favours leading to a chain of further connections and interactions.</p>
<b>CIRCLES</b>		<p>There is a single ball floating in the air (not hovering). There are 3 separate gravity fields in the room, up left and right.</p>	<p><b>Feeling</b></p> <p><b>Interaction</b></p> <p><b>Motivation</b></p>		<p>Can use this mechanic somewhere else</p>	
<b>EYE (ALSO CIRCLE)</b>		<p>A room full of randomly sized eyes. The eyes look at you or a random direction, they also blink randomly. If you get close they look directly at you and then become smaller if you try to touch them.</p>	<p><b>Feeling</b> - Being under pressure, being watched and observed, overcoming that with distraction</p> <p><b>Interaction</b> - All eyes follow the player if they move. Once they stop then they get bored and leave.</p> <p><b>Motivation</b> - Eyes get closer to player, can't be swatted away. once player stops moving the eyes float away</p>			<p><i>Our gaze can have a powerful effect on another, especially when under the gaze of many. It doesn't take much for us to lose interest. Where does that leave the performer?</i></p>
<b>PLANET (ALSO ALSO CIRCLE)</b>		<p>Another empty room with a statue of Venus de Milo. The statue has a small drawer inside of it. If you open it then you can find a small desert ball, there are a few rocks on it and another small statue of the Venus. If you pick up the ball and let it go it maintains its momentum</p>	<p><b>Feeling</b> - Curiosity, noticing of the tiny details. Listening</p> <p><b>Interaction</b> - Listen and notice sound coming from inside the statue. Open the drawer and look at an intricate object. Find a place for the object. It becomes bigger?</p> <p><b>Motivation</b> - Sound, have to be audible from the start, get louder as approached</p>		<p><i>Taking notice of the little things, even if they are hard to find can make a world of difference. Listening for clues can lead you down the correct path</i></p>	<p>Taking the time to concentrate on the smaller things, and pay attention to those that you normally wouldn't can have great benefits. Slowing down and listening and focusing can bring many benefits to wellbeing.</p>

Change to hexagonal prism?

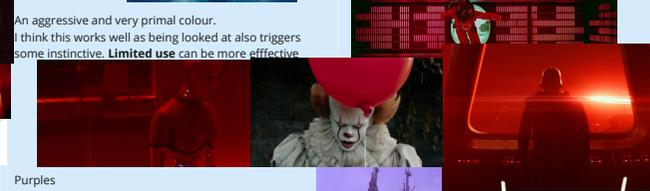
The visual aesthetic for each room, focused on creating the atmosphere that was reflective of the surrealist works. Early experiments with desert environments and using greek columns or statues, helped to push me into the more abstract environments that were used in the final prototype. The result of this exploration was the use of simple geometric shapes allowed me to develop a clean design language around each of the primitives.

The use of colour was also limited. Each of the rooms was matched with a distinct colour, developed from the mathematical creation of colour within Unreal Engine and appropriate visual connotations. The chosen shader was created in order to avoid the default look of Unreal Engine, which is tailored towards highly realistic lighting, shading and texturing. This shader removed most lighting and applied a white flat texture over all elements with the use of edge outlines for detail. This works well with the simple shapes and lines of the 3D elements. Colour was applied using a depth calculation to give smooth gradients based on how far the player's camera was from the object. This helped add depth, something that is emphasised in VR due to its stereoscopic, and also is more visually interesting than purely flat colour.

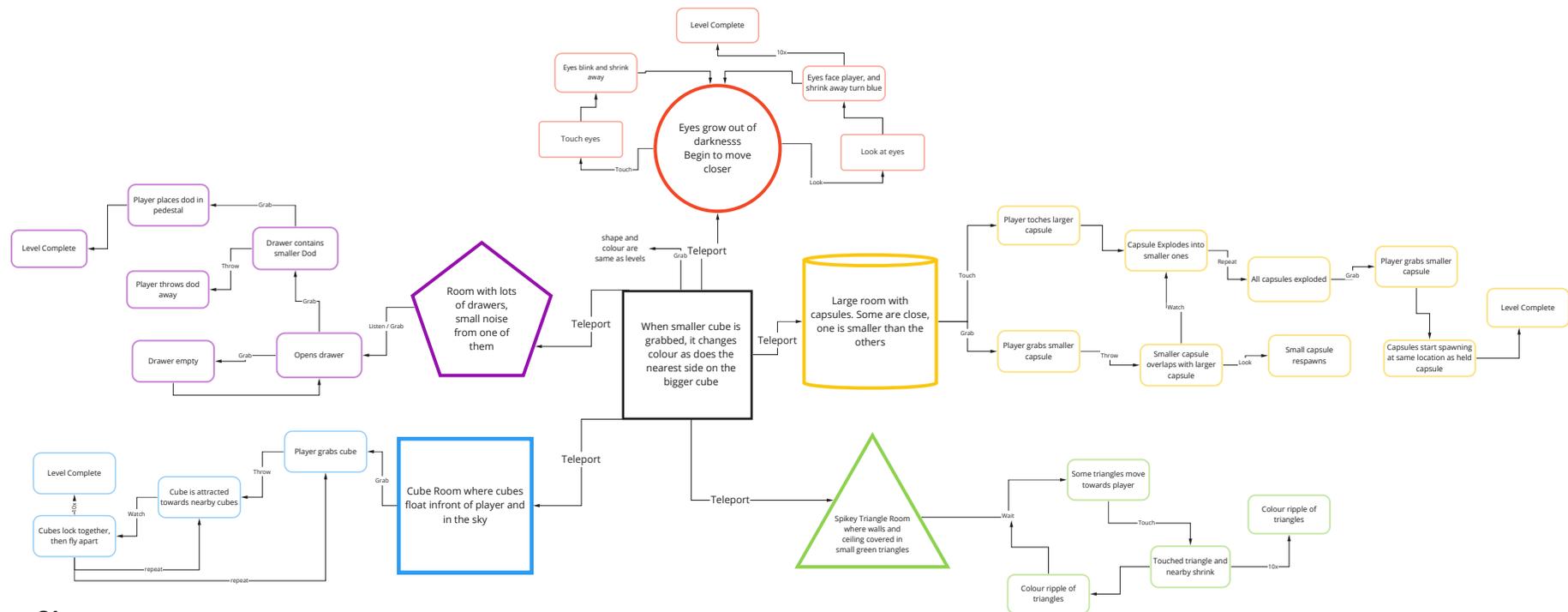
**Figure 30**

*Colour and Shape Associations for Each Room*

Note. The initial atmosphere that was targeted for each room, matching the colour with the symbolic language of basic primitives.

SHAPE	COLOUR	IMAGE
<p>Square</p>	<p>Primarily black and white, but the colours of the cube need to match. They also probably shouldn't be as distinct.</p> <p>Also black and white offer a lot of contrast, whereas if I want to represent the mind, a more white would be better.</p>	
<p>Triangle:</p> <p>Seen as stable. Not often associated with nature, but can be seen as aggressive. Can be incievably sharp, dangerous. Instinctive.</p>	<p>Can be nature, but also sickness and destruction In contrast with red, we have a natural warning signal, something that has been replicated by human culture.</p>	
<p>Capsule</p> <p>Harder to associate symbolism with this. Could perhaps change to a coin?</p> <p>The capsule is usually containing something (pill) Not really naturally occuring. pills drugs have many other connotations.</p> <p>Coin also has connotations of money and again pills and drugs...</p> <p>Circles are more natural, especially if they are smaller</p>	<p>Yellows</p> <p>😊 Happiness, satisfaction. Can also be sickness and madness. I think the tone here helps.</p>	
<p>Square</p> <p>Stability, even and multi sided. Has many rooms for connection, fits together into a single object.</p>	<p>Blues</p> <p>Colours of trust, calming, life and satbility. Yet also can represent isolation. <b>CONTRAST with ORANGE</b>, which can also be life, spark</p> <p>I want to emphasise community and the interconnected</p>	
<p>Circle / eye.</p> <p>Whole, gaze, soul, power, aggression, complex instinctive. full of meaning, easily recognisable</p>	<p>Red</p> <p>An aggressive and very primal colour. I think this works well as being looked at also triggers some instinctive. <b>Limited use</b> can be more effective</p>	
<p>Hexagon</p> <p>two interlocking triangles, stability also associated with mystery and the occult, religion. Features on uranus, alchemical oddities around reptiton and patterns</p>	<p>Purples</p> <p>Purples are a bit more calming than red, also usually mysterious. This can fit with the emptyness of the space and the action of pausing, listening and hunting for the sound.</p>	

# DESIGN FINDINGS



**Figure 31**

*Interaction Flow Diagram*

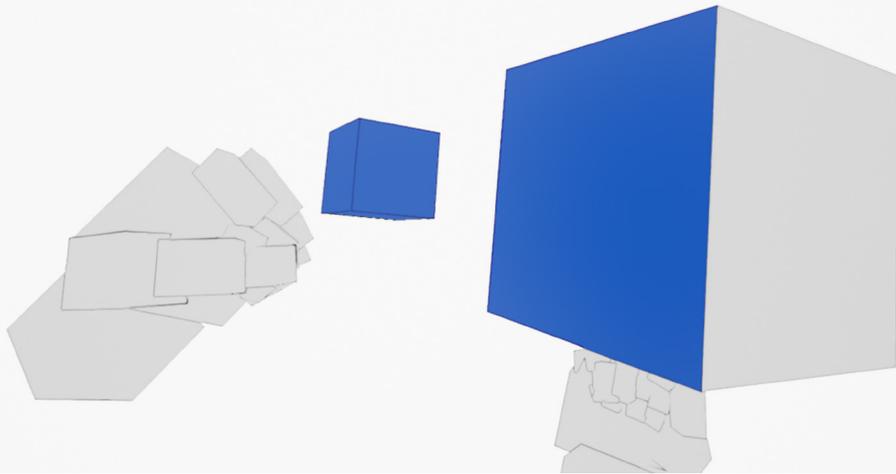
*Note.* The interactions and gameplay loops for each room, with descriptions describing the systems in each one.

The final output is a game design prototype that provides an accessible VR game that lets players explore a series of rooms with gameplay mechanics that are constructed around an element of wellbeing. The primary focus of the research was the development of mechanics; and the integration of these mechanics with a wellbeing framework. Visual aesthetics were certainly a consideration but were lower on the priority list for development. The core interactions are deliberately kept simple and intuitive in order for the players to quickly learn, and for the game to be accessible. Figure 31 shows the interaction flowchart for the game. Initially the gameplay mechanics were focused around components in The Five Ways of Wellbeing. Some of these worked more successfully than others, such as “be active”, getting players to move around the space, or “take notice” listening and looking at different elements within the level. Others were harder to integrate, such as the social and communal aspects of

wellbeing, as the game is limited to a single player experience, so some of these rooms diverged away from this initial framework. The red room demonstrated a key mechanic shift. The eyes follow the player, building a sense of tension and unease, the implications about being watched, observed or under pressure became obvious. By having the player experience this and then being able to resolve the situation through confronting the “watchers” through touching them the player can perhaps build a confidence around how they perceive the eyes. . The game mechanics evolved through design testing as my confidence as a programmer increased.

The key takeaway from the design is that each room enables the player to feel *an* emotion, hopefully a positive one. Ideally their response is aligned to that in figure 40, but each player will interpret the shapes, colours and music slightly differently. The movement and interaction with the shapes and placement of elements in their environments implies intent, which enables players to have agency over how they interpret and interact with the room.

Each room has many elements of random or systematic generation, from the placement of elements, colours, physics and musical notes. The elements are generally spawned, or created, within a set of defined parameters. Many of the elements have physics simulation which always adds an element of unpredictability. The music is generated with a random set of notes playing from a major chord, then modified from room to room. This changes the tone of each room, while still giving an overall sense of atmosphere that is interesting. The random notes create a slight sense of unease as they don't follow traditional musical structure. The use of these randomly generated elements has the benefit of saving construction time and also changes the room layout for repeat visitors. The mechanics work alongside the systems of wellbeing so that can be neatly described and defined, but never fully predicted. This element of unpredictability reflects the unpredictable nature of wellbeing (Dodge et al., 2012). The following show a series of screenshots from the prototype, with descriptions explaining the action. Note that it is difficult to capture many of the elements of a 3D virtual world with a single still screenshot.



**Figure 32**

*Hub Room*

*Note.* The Teleporter cube, this cube teleports the player in response to which side the smaller cube is closer too. Colours and shape help to differentiate each side.

SHAPED

**Figure 33**

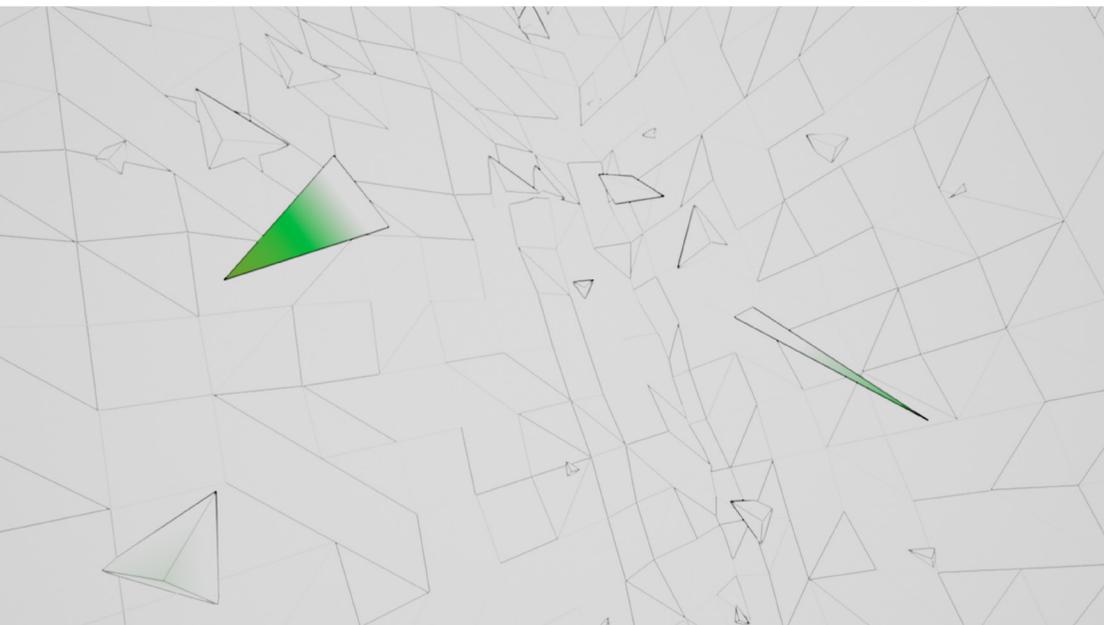
*Hub Room Title*

*Note.* This is the title in the hub room it helps to give people a focus point and it changes as each level is completed.

**Figure 34**

*Green Room*

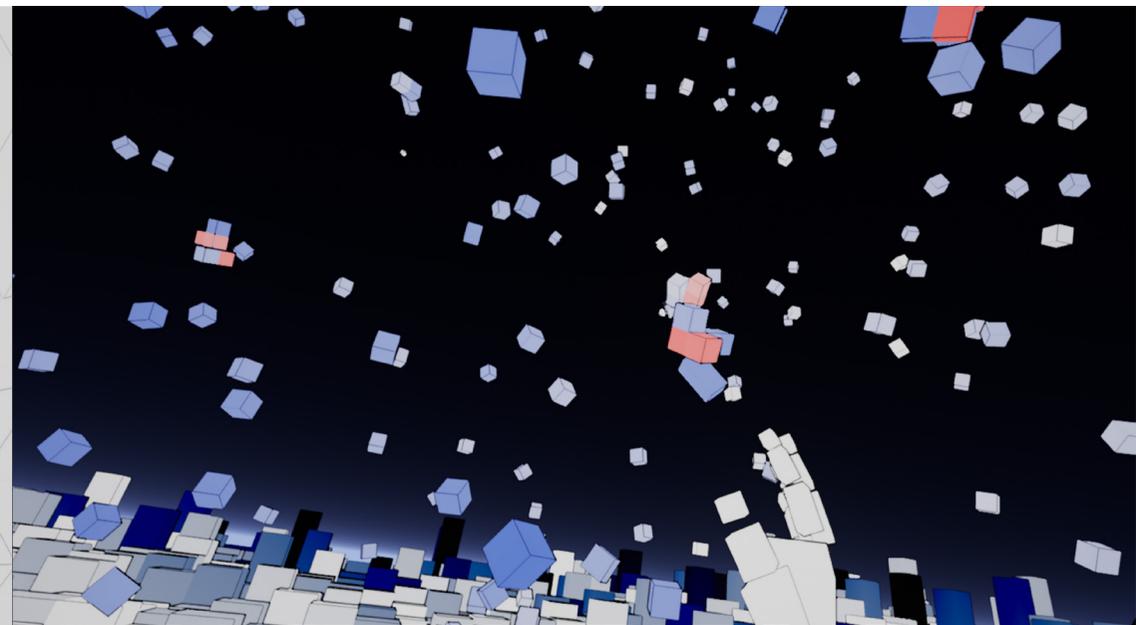
*Note.* Here we can see the colour gradients. The triangles extend towards the player but never quite touch them. The player is fully enclosed by this room.

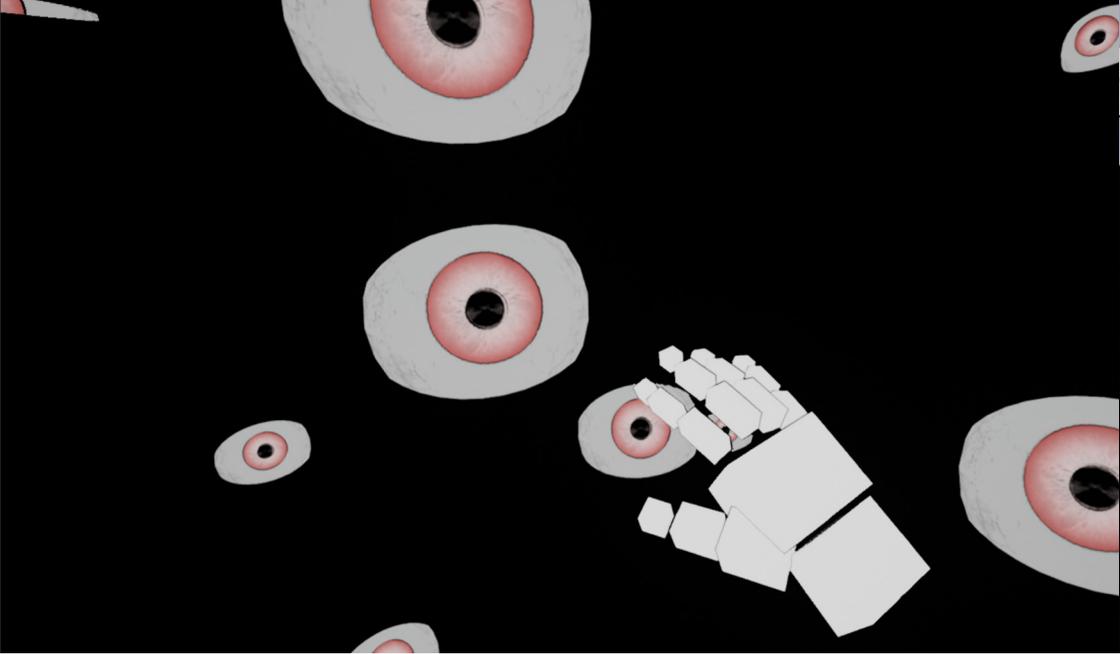


**Figure 35**

*Blue Room*

*Note.* This shows some of the interactions within the blue room. The cubes connect and disconnect once the player begins to interact with them. Seen here throwing a cube.

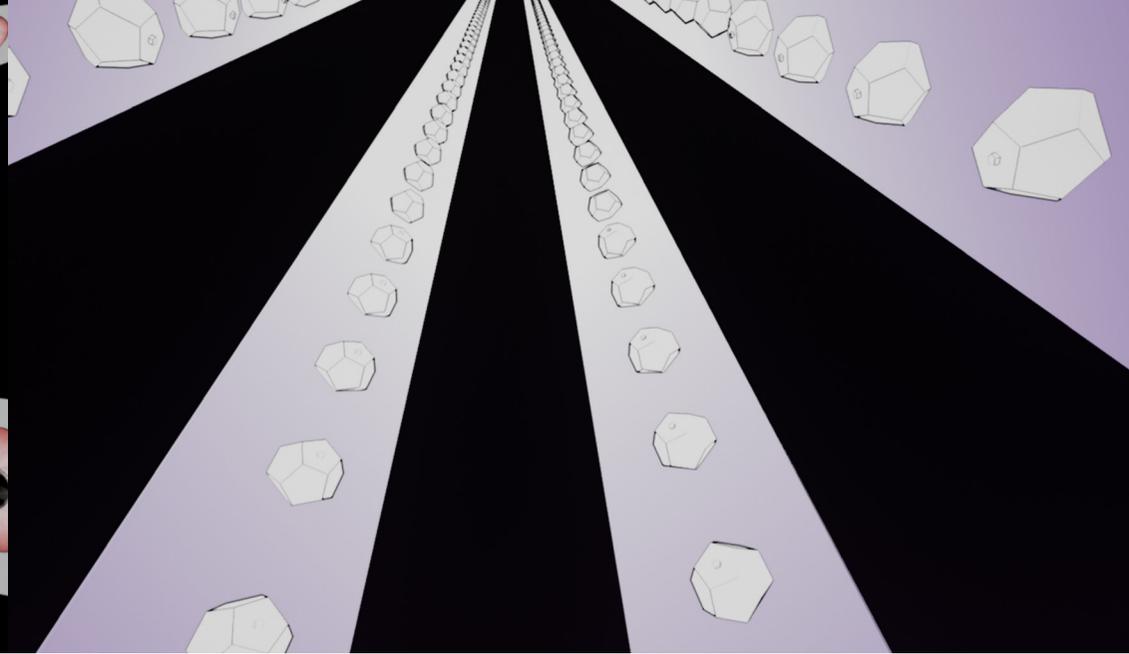




**Figure 36**

*Red Room*

*Note.* Here we see a player reaching out to touch the eyes. They continue to approach player, blinking but will retreat, shrink and turn blue when looked at.



**Figure 37**

*Purple Room*

*Note.* The advantages of a digital environment means the creation of seemingly endless worlds. The gradient colour here can be seen enhancing the effect.

**Figure 38**

*Purple Room Interaction*

*Note.* The use of sockets and shapes helps to direct the player towards the goal of each level. Here we see the small dodecahedron being placed into the socket.



**Figure 39**

*Yellow Room*

*Note.* The player here is shown throwing a cylinder to hit the further away cylinder that is out of reach. The satisfying pop when hit seemed to surprise many players



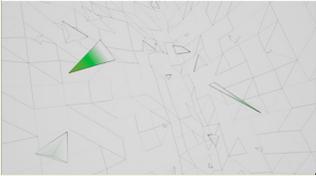
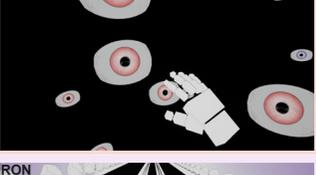
	PICTURE	DESCRIPTION	MECHANIC FEATURE	WELLBEING RESEARCH	COLOUR / SHAPE	ARTISTIC RATIONALE
	Visual indication of what it looks like	Description of interactions	Goals or targets for the room, each room needs feeling, interaction, motivation	Research or background on room	Associations with Colour and Shape	Rationale for interactions
HUB ROOM		The teleporters have been replaced with a two cubes. Each of these once selected the nearest side of the larger cube, and the small cube light up the same colour. This allows the player to clearly see which side is active. Once the player lets go of the smaller cube then it is attracted to the large cube.  If the player isn't holding the large cube it will hover around chest height, it will also not teleport if not held.	Teleport to each room. Once goals are completed each letter of the SHAPED title changes to reflect the room completed.		<b>White, Neutral</b> Primarily black and white, but the colours of the cube need to match. They also probably shouldn't be as distinct.  Also black and white offer a lot of contrast, whereas if I want to represent the mind, a more white and soft palette would be better.	
TRIANGLE		A room where all sides are enclosed. There are small triangles on the wall. They very slowly start to get bigger, increasing in size but stopping before piercing the player.  If the triangles are touched then they shrink back, as do their neighbours. There is also a ripple of colour through it's nearest neighbours. Their colour changes the closer they are to the player, with it being red on the very tip and green in the middle.	<b>Feeling</b> - Tension  <b>Interaction</b> - Touching the triangles to stop them encroaching on the middle  <b>Motivation</b> - The triangles begin to move by themselves	Be active, a crucial part of wellbeing, being physical, but also putting yourself out in the community and being proactive about your environment. Can definitely be harder if someone struggling with mental health. By touching the triangles we can see that their apparent threat is non-existent and it can be an enjoyable experience.	<b>Green, Red Tps</b> Can be nature, but also sickness and destruction In contrast with red, we have a natural warning signal, something that has been replicated by human culture.  <b>Triangle</b> Seen as stable. Not often associated with nature, but can be seen as aggressive. Can be inconceivably sharp, dangerous. Instinctive.	<i>Action is crucial, without it the world continues without us. Even a simple action, such as touch, can have a profound effect on another. Will you act in time?</i>
CYLINDER		A room surrounded by large cylinders. Closer to the player are smaller ones if touched they pop and explode into more. Some are harder to reach and there is an even smaller cylinder that needs to be thrown to pop them. Once all are popped then an infinite amount of cylinders will spawn from the smallest one	<b>Feeling</b> - Satisfaction.  <b>Interaction</b> - Touching the pulsing cylinders or moving the small cylinder makes them pop into more.  <b>Motivation</b> - The creation of more cylinders automatically shows it's a resource that is infinite.	Giving time and attention to others, not only boosts your wellbeing but also others. Being selfless has benefits all around. Even if it is done for selfish reasons it can still benefit both parties.	<b>Yellow</b> Happiness, satisfaction. Can also be sickness and madness. I think the tone here helps.  <b>Cylinder</b> Stability, support, foundation. Combination of sphere and square.	<i>Sometimes we have plenty, there are other times when we are lacking. In times of plenty it is important to give. Time, energy or attention. Just a little.</i>
SQUARE		There are squares that float around the player. These can be picked up and hit/thrown at the other squares. Once they hit another square it begins a chain reaction to connect and collide with other squares. Once there is a chain of 5 or more then the cube turns red	<b>Feeling</b> - Connection.  <b>Interaction</b> - Pick a square and make them touch. This connects to other squares and they change colour. Each square will change once it hits another. Will also effect neighbours.  <b>Motivation</b> - They are floating in front of player. Will have enough for player to have to interact.	Connection with others can be hard to achieve, but little actions can go a long way. People tend to reciprocate favours leading to a chain of further connections and interactions.	<b>Blues</b> Colours of trust, calming, life and stability. Yet also can represent isolation. CONTRAST with ORANGE, which can also be life, spark  I want to emphasise community and the interconnected nature of it here. The blues need to not be too intense or aggressive.	<i>Every instant there are an infinite set of possible interactions. It only takes one moment to spark a chain of unending connectors.</i>
CIRCLE		A black room. Slowly eyes grow for a while then stare at the player, occasionally blinking and looking in a different direction. They slowly move towards the player, if looked at touched they shrink away, turn blue and get smaller.	<b>Feeling</b> - Being under pressure, being watched and observed, overcoming that with distraction  <b>Interaction</b> - All eyes follow the player if they move. Once they stop then they get bored and leave.  <b>Motivation</b> - Eyes get closer to player, can't be swatted away, once player stops moving the eyes float away	Many people are focused on themselves, how the world views them. But in reality most others are also focused on themselves. This fleeting attention causes many people stress and anxiety, but if we step away from it we can realise how little importance it has.	<b>Red</b> An aggressive and very primal colour. I think this works well as being looked at also triggers some instinctive. Limited use can be more effective <b>Circle, Sphere, Eye</b> Whole, gaze, soul, power, aggression, complex instinctive, full of meaning, easily recognisable	<i>Our gaze can have a powerful effect on another, especially when under the gaze of many. It doesn't take much for us to lose interest. Where does that leave the performer?</i>
DODECAHEDRON		A pentagonal platform attached to infinite columns. There seems to be an infinite amount of dodecahedrons extending to the sky.  Each drawer has a small handle on it which can be grabbed. If the player stops and listens they can hear a noise coming from one of them. Inside one of these is a smaller dod. This then fits inside the dock in the middle, that shrinks down and disappears.	<b>Feeling</b> - Curiosity, noticing of the tiny details. Listening  <b>Interaction</b> - Listen, Search, Look, Place.  <b>Motivation</b> - Sound, Missing item, socket, Draws invite interaction	Taking the time to concentrate on the smaller things, and pay attention to those that you normally wouldn't can have great benefits. Slowing down and listening and focusing can bring many benefits to wellbeing.	<b>Purple</b> Calming, Mysterious. This can fit with the emptiness of the space and the action of pausing, listening and hunting for the sound. Soft, use with blues and pinks to make stand out. Alien <b>Hexagon</b> Two interlocking triangles, stability also associated with mystery and the occult, religion. Features on uranus, many mathematical oddities around repetition and patterns	<i>Taking notice of the little things, even if they are hard to find can make a world of difference. Listening for clues can lead you down the correct path</i>

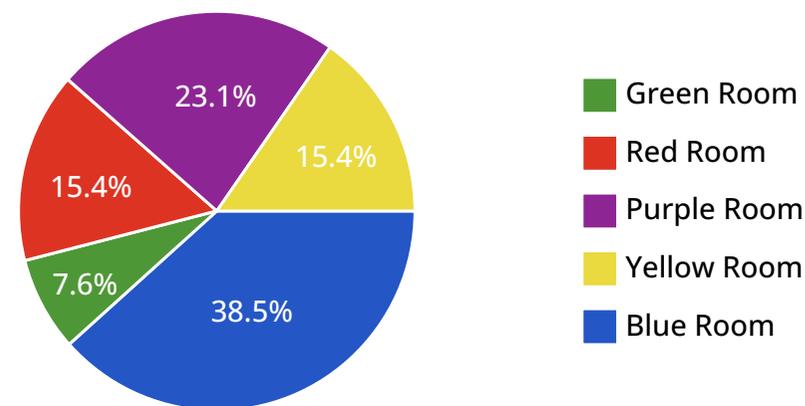
Figure 40

Interaction and Gameplay Mechanic Diagram

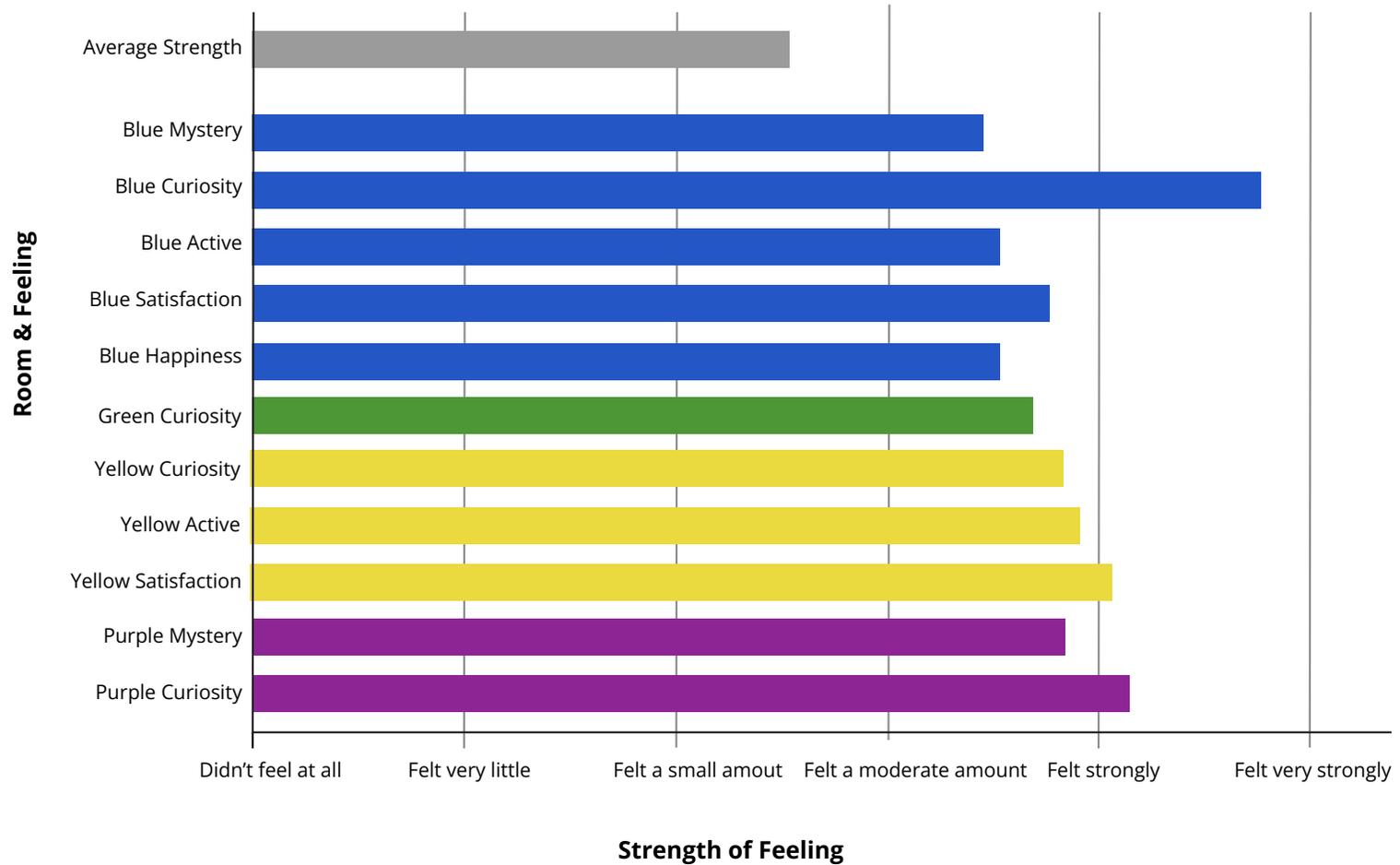
Note. The targeting feelings, medications and interactions for each room. This table helped to solidify and record what ideas and mechanics are associated with each room

# USER TESTING

User testing was conducted over two sessions with 2nd - 4th year Design students at Massey University. A low risk ethics application was approved to enable play-testing. Players were recorded playing the game and could choose to stop at any time, or to resolve any technical bugs. Afterwards, they would answer a survey where they were presented with a list of possible associations for each room and then offered a chance to give their own opinion on the theme of that room. The first session didn't have a completion state to the game and many players found this frustrating or unsatisfying. The second session did have a completion state which increased engagement time by almost double. Overall, the participants' responses to multi choice questions about how they felt in each room was generally associated with the correct positive or negative design intent (see figure 40). Yet when asked to describe in their own words what the theme of each room was they used a surprising amount of negative feelings and emotions for their descriptions, with the exception of the yellow room. The blue room elicited intended responses such as "Connections", "Connectedness" and "Grouping", yet it also had "Loneliness" and "Anxiety" from multiple participants. Figure 42 shows the most common strongly felt responses were 'curiosity' and 'mystery' and 'active'. This is likely due to the puzzle mechanics, I observed the participants would go to extreme lengths in order to figure out the solution to each room. When questioned if they felt like they were forced as they were being supervised, a participant said no, they just really wanted to complete it. The most striking success was the ability for the range of players to be able to engage with and understand the mechanics. Almost all the players on the second session managed to complete each room, figuring out the rules and engaging with all available systems, most had little or no VR experience and some had very little experience with video games either. Overall user testing revealed that participants were keen to ascribe meaning to each room, and received the rewards typically associated with video games, such as a sense of feiro, or a sense of challenge, and sense of autonomy and competence from SDT. Yet translation of their behaviours into actionable and positive wellbeing behaviour is something that was potentially too abstract and could be further improved.



**Figure 41**  
Responses to Question 3, Which room did you find the most interesting?



**Figure 42**

*Highest Average Responses to Feelings in Rooms*

*Note.* This graph is a selection of the reported feelings that were higher than the average response. 'Curiosity', 'mystery' and 'active' were common strongly felt feelings amongst many of the rooms. See full responses in Appendix B

# LIMITATIONS AND FURTHER DEVELOPMENT

The balance between abstraction and direct references to wellbeing was difficult to develop and led to some players missing out on this layer altogether. Further refinement and user testing could help make sure this narrative is expressed effectively. The artist models used such as Hilma af Klint, Andreas Wannerstedt and the surrealists, built on existing bodies of work. This helps to make their common themes, motifs and tropes clearer to the audience as they explore these themes through many perspectives and iterations. There were also many layers of game design that were skipped, there are no characters, lighting, dialogue, composed music, multiplayer or detailed textures. These are not specifically required for a game and were deliberate, self-imposed limitations in order to complete this prototype. Yet all are elements and tools that a game designer can use to reinforce the players experience. Further development by using these elements in the game could help to solidify some of the more abstract ideas and along with further testing reinforce the wellbeing mechanics. The release of a VR game that could be downloaded and played privately is a possibility however, I believe the context of a gallery or exhibited in a public space, such as a university, would give a stronger sense of intention and less likely to be seen as a traditional game

The medium of VR, while providing an immersive and natural interaction platform also has limitations around both accessibility and familiarity with the platform. It also has the potential to induce motion sickness or dizziness, which was mostly mitigated with the use of room-scale, but the familiarity with controls is harder to overcome. As VR becomes more accessible and ubiquitous, with hand tracking and smaller headsets that don't require external trackers this is likely to become less of an issue. It is also physically isolating, a trade-off for deeper immersion. While the positives including immersion and intuitive interaction are highly desired, the inaccessibility and unfamiliarity of the platform restricts its possible audience.

A user base for testing could lead to the refinement of the gameplay mechanics more specifically targeting wellbeing, by testing more variations of shapes, sounds and colours we could then refine each room to elicit the targeted emotional response more frequently. Also, the introduction of a key component of wellbeing that was missing, that of community connection. This was deliberately avoided due to the complicated nature of multiplayer and game design and the need for even more user testing. Adding another player and exploring multiplayer connections, similar to Journey would also have a great benefit, encouraging interaction and connection, a key element of wellbeing.

# CONCLUSION

This prototype aimed to explore the space between wellbeing and videogames. The importance of wellbeing and of video games in young people's lives has been demonstrated, but is always in need of further evidence and examples and research. Learning the language of programming as a solo developer was difficult but rewarding, and would benefit greatly doing future work with a team. Solo game development is the exception rather than the norm and there are many elements in this project that could be enhanced with outside experts. Balancing the rigorous scientific elements of wellbeing research and the vague and undefined artistic elements of my artist models was demanding and creating a design piece that satisfied both, was challenging. However, the outcome was successful in many regards, watching users experience the game was much more interesting than expected, trying to predict their behaviour and to guide it purely through abstract elements, and assumptions about behaviour was an endlessly fascinating process. There is space for a more psychological exploration of player behaviour and even wellbeing treatment. The prototype successfully demonstrates an accessible VR game that elicited positive feelings and emotions, based on wellbeing frameworks. The use of simplified mechanics and abstract design were key elements in its success and it can be considered a useful foundation for further exploration.

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# GLOSSARY

## *Blueprints*

A node based, visual coding system of Unreal Engine, used as an alternative to C++

## *Feiro*

Triumph over adversity, a primal and powerful neurochemical high (McGonigal, 2011).

## *Flow*

A satisfyingly and exhilarating sense of creative accomplishment and heightened functioning (Csíkszentmihályi, 1975).

## *Immersion*

Immersion, or spatial presence, is when a player's full mental focus is within the virtual space or world that is presented to them (Madigan, 2016).

Room-scale

## *Liberal Humanism*

A social philosophy that prioritises individualism and self belief, with policy and social rules dictated by logic and reason (Harari, 2015).

## *Mechanics*

Systems bound by rules within a game that the player can interact with.

## *Mental Capital*

A persons cognitive and emotional resources. Their ability to respond to daily challenges. (Foresight Mental Capital and Wellbeing Project, 2008).

## *System One and System Two*

Daniel Kahneman's description of the two elements that make up the mind. System one, or the experience self is instinctive fast reacting. System two, the narrative self is slower and more deliberate with decision making (Kahneman, 2013)

## *Unreal Engine*

A game engine created by Epic Games, free to developers.

## *Wellbeing*

Individuals have the psychological, social and physical resources they need to meet a particular psychological, social and/or physical challenge (Dodge et al., 2012).

## *Virtual Reality*

A digital platform where the user uses a tracked, headmounted display to replicate their movements in a virtual world.

## *Wellness*

A healthy lifestyle beyond acute illness, covering both mental and physical health (Pendell, 2021).

# LIST OF FIGURES

## Figure 1

### *Wellbeing Framework*

*Note.* A wellbeing framework example. Not that happiness or positive feelings are only a small part of the overall model in personal wellbeing. Based on a figure in “*New Economics Wellbeing Report*” by Michaelson et al., 2009, p21.

## Figure 2

### *Te Wheke*

*Note.* A holistic model of Māori wellbeing, with the head, the eyes and the arms representing different aspects of wellbeing. Based on the model by Pere & Nicholson, 1997.

## Figure 3

### *Definition of Wellbeing*

*Note.* The careful balancing act of balancing resources and challenges to maintain a balanced wellbeing. Based on a model from *Challenge of Defining Wellbeing* by Dodge et al., 2012, p. 230.

## Figure 4

### *The Five Ways to Wellbeing Poster*

*Note.* An introduction to each of the Five Ways to Wellbeing and their summaries. From *Poster: Five Ways to Wellbeing (English)* [Digital Poster] by The Mental Health Foundation, 2009. (<https://mentalhealth.org.nz/resources/resource/poster-five-ways-to-wellbeing-english>)

## Figure 5

### *The Wellbeing Aesthetic on Social Media*

*Note.* An example of prominent wellbeing aesthetic picked from a selection of images on Pinterest. Retrieved June 2nd 2021, from (<https://www.pinterest.nz/kevinalorraine/wellness-aesthetic/&sa=D&source=docs&ust=1653214363162285&usg=AOvVaw2WzZtHwZHVZj45MKqZIIH>). Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

## Figure 6

### *Wellbeing Aesthetic Posters*

*Note.* A selection of motivational posters using the common trope of a quote over a softly coloured background. Retrieved June 2nd 2021, from ([www.nadjavanosch.com](http://www.nadjavanosch.com)). Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

## Figure 7

### *Inspirobot inspirational posters*

*Note.* A collection of randomly generated inspirational posters, using an algorithm to create unique posters. Retrieved May 3rd 2022, from ([www.Inspirobot.me](http://www.Inspirobot.me)).

## Figure 8

### *Tetris Effect*

*Note.* Screenshot of Tetris Effect, the particles and animations completely envelop the player when played on a virtual reality platform, helping to enhance the flow experience. Retrieved from Tetris Effect Press Kit, 2019. [https://drive.google.com/drive/u/0/folders/11vg\\_njDMFp1Sbl\\_5eEAX5DT4ZRa5RTm7](https://drive.google.com/drive/u/0/folders/11vg_njDMFp1Sbl_5eEAX5DT4ZRa5RTm7).

**Figure 9***Definition of Fun in a Video Game*

*Note.* Based on figure 3 we can define 'Fun' in a video game by depicting the balancing of challenges and resources.

**Figure 10***Journey Screenshot*

*Note.* Screenshot from *Journey* showing the use of simple environments and character designs but a powerful sense of atmosphere and narrative. From Journey Steam Store Page, 2012.

<https://store.steampowered.com/app/638230/Journey/>

**Figure 11***Journey Multiplayer*

*Note.* A screenshot of two characters interacting in *Journey*. They can only communicate through movement or a simple call action. From Journey Press Kit, 2012, (<https://www.igdb.com/games/journey/presskit>).

**Figure 12***KIDS Screenshot 1*

*Note.* Screenshot from *KIDS* showing the repeated use of simple characters, composed to create highly emotive imagery and gameplay. From KIDS Press Kit, 2019, (<https://playkids.ch/presskit/images/stills/kids-still-1.png>).

**Figure 13***KIDS Screenshot 2*

*Note.* This screenshot requires the player to tap on the hole in order for the characters to jump down. From *KIDS Press Kit*, 2019, (<https://playkids.ch/presskit/images/stills/kids-still-3.png>).

**Figure 14***The Swan No. 1.*

*Note.* We can see Hilma af Klints first in the *Swan* series exploring the dualities of life and death, male and female and light and darkness.

Hilma af Klint. (1915). *The Swan No. 1*. [Painting]. The Secret Paintings, Wellington City Art Gallery, Wellington, Date of exhibition, December, 2021. Photograph authors own. Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

**Figure 15***The Swan No. 8.*

*Note.* In this painting we can see the almost complete abstraction of the swans into cubes and beams of light.

Hilma af Klint. (1915). *The Swan No. 8*. [Painting]. The Secret Paintings, Wellington City Art Gallery, Wellington, Date of exhibition, December, 2021. Photograph authors own. Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

**Figure 16***False Mirror*

*Note.* René Margitte's use of clouds in the iris of an eye is a typical example of juxtaposition used by the surrealists.

René Margitte. (1929). *False Mirror* [Painting]. Museum of Modern Art, New York. (<https://www.moma.org/collection/works/78938>). Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

**Figure 17***The Enigma of a Day*

*Note.* The strange placement of elements in this scene draws the eye and the mind to questioning the intention.

Giorgio de Chirico. (1914). *The Enigma of a Day* [Painting]. Museum of Modern Art, New York.

([https://www.moma.org/collection/works/80587?artist\\_id=1106&page=1&sov\\_referrer=artist](https://www.moma.org/collection/works/80587?artist_id=1106&page=1&sov_referrer=artist)). Image being re-used under NZ Copyright Act 1994 s.42 which provides for the copying of a work for purposes of criticism or review accompanied by sufficient acknowledgment.

**Figure 18***External Installations*

*Note.* A screenshot from a computer generated video by Andreas Wannersedt (2020) that shows the use of simple geometric shapes in surreal natural environments. The movement of the objects is smooth and satisfying. From *External Installations*, (2020), [Video File].

([https://pro2-bar-s3-cdn-cf6.myportfolio.com/1a59bd5334e07bdab23db8ff29d19008/76cf64a4-6396-427d-88be-01a6d6a952cf\\_rw\\_1920.jpg?h=d26cded83bd8b849d13e1c8c284b30ff](https://pro2-bar-s3-cdn-cf6.myportfolio.com/1a59bd5334e07bdab23db8ff29d19008/76cf64a4-6396-427d-88be-01a6d6a952cf_rw_1920.jpg?h=d26cded83bd8b849d13e1c8c284b30ff))

**Figure 19***Levitation*

*Note.* The use of simple shapes and interaction still make for a compelling experience. From Images for Media [Digital Installation] by teamLab (2021).

([https://www.dropbox.com/sh/3fds98joo3pzz7p/AADAZroWqQ1arrNqqda\\_TFvWa?dl=0&preview=Levitation\\_swimsuit\\_03.jpg](https://www.dropbox.com/sh/3fds98joo3pzz7p/AADAZroWqQ1arrNqqda_TFvWa?dl=0&preview=Levitation_swimsuit_03.jpg))

**Figure 20***Initial Mind-Map Exploration*

*Note.* Various branches of my mind map exploring the core ideas of my initial research

**Figure 21***Convergent Design Process*

*Note.* Convergent design model indicating some of the key divergences during my design process. Adapted from Nigel Cross's Convergent Design in Dubberly, H., 2008, page 25.

**Figure 22***Wellbeing and Gaming Axis Map*

*Note.* An axis map created in order to gauge the relevance of my resources. This helped identify the need for more cross-over resources.

**Figure 23***Five Ways To Wellbeing Room Moodboard*

*Note.* My visual exploration for rooms and ideas based on the Five ways to Wellbeing. You can see the beginnings of the eyes in the top right, and the use of swarms or flocks in the top left, both of which feature in the final design.

**Figure 24***Game Development Process*

*Note.* My game development method, develop and self test took place within Unreal Engine using the blueprint system, this step was the most time consuming. Based on *Software Development Model* by Alan Cooper (Dubberly, 2008).

**Figure 25***HTC Vive*

*Note.* A depiction of the VR HMD that will be used for this project. From *HTC VIVE*, [https://en.wikipedia.org/wiki/HTC\\_Vive#/media/File:Vive\\_pre.jpeg](https://en.wikipedia.org/wiki/HTC_Vive#/media/File:Vive_pre.jpeg). CC BY 2.0

**Figure 26***Early Unreal Engine Experiments*

*Note.* Early experiments using a first person game mode and the default Unreal Engine character model.

**Figure 27***Blueprint Visual Coding System*

*Note.* An example of some code created in the blueprint coding system that I used in Unreal Engine

**Figure 28***MDA Framework*

*Note.* The relationship of the game components to their design counterparts as demonstrated in the MDA Framework. Based on a model by Hunicke et al., 2004 in *MDA: A formal approach to game design and game research*, page 2.

**Figure 29***Room Breakdown Table.*

*Note.* Each column shows the different aspects of each room, describing the feeling, colours, relation to wellbeing and mechanics.

**Figure 30***Colour and Shape Associations for Each Room*

*Note.* The initial atmosphere that was targeted for each room, matching the colour with the symbolic language of basic primitives.

**Figure 31***Interaction Flow Diagram*

*Note.* The interactions and gameplay loops for each room, with descriptions describing the systems in each one.

**Figure 32**

*Hub Room*

*Note.* The Teleporter cube, this cube teleports the player in response to which side the smaller cube is closer too. Colours and shape help to differentiate each side.

**Figure 33**

*Hub Room Title*

*Note.* This is the title in the hub room it helps to give people a focus point and it changes as each level is completed.

**Figure 34**

*Green Room*

*Note.* Here we can see the colour gradients. The triangles extend towards the player but never quite touch them. The player is fully enclosed by this room.

**Figure 35**

*Blue Room*

*Note.* This shows some of the interactions within the blue room. The cubes connect and disconnect once the player begins to interact with them. Seen here throwing a cube.

**Figure 36**

*Red Room*

*Note.* Here we see a player reaching out to touch the eyes. They continue to approach player, blinking but will retreat, shrink and turn blue when looked at.

**Figure 37**

*Purple Room*

*Note.* The advantages of a digital environment means the creation of seemingly endless worlds. The gradient colour here can be seen enhancing the effect.

**Figure 38**

*Purple Room Interaction*

*Note.* The use of sockets and shapes helps to direct the player towards the goal of each level. Here we see the small dodecahedron being placed into the socket.

**Figure 38**

*Yellow Room*

*Note.* The player here is shown throwing a cylinder to hit the further away cylinder that is out of reach. The satisfying pop when hit seemed to surprise many players

**Figure 39**

*Interaction and Gameplay Mechanic Diagram*

*Note.* The targeting feelings, medications and interactions for each room. This table helped to solidify and record what ideas and mechanics are associated with each room

**Figure 40**

*Responses to Question 3, Which room did you find the most interesting?*

**Figure 41**

*Highest Average Responses to Feelings in Rooms*

*Note.* This graph is a selection of the reported feelings that were higher than the average response. 'Curiosity', 'mystery' and 'active' were common strongly felt feelings amongst many of the rooms. See full responses in Appendix B

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# APPENDIX

## APPENDIX A:

Link to Working Miro Board:

[https://miro.com/app/board/o9J\\_IR0AX5U=?share\\_link\\_id=240369119443](https://miro.com/app/board/o9J_IR0AX5U=?share_link_id=240369119443)

## APPENDIX B:

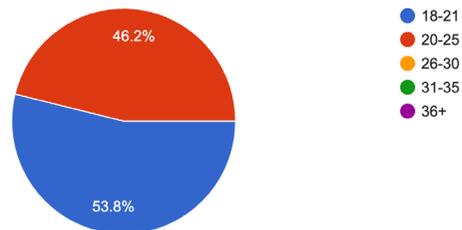
Survey Shaped: Exploring Wellbeing through Play, Virtual Reality, and Abstraction Survey

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz).

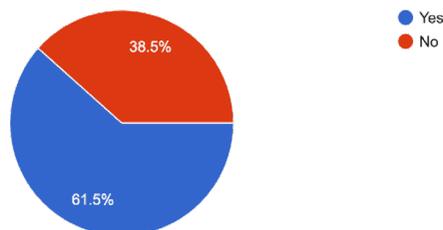
Question 1: What is your age range

13 responses



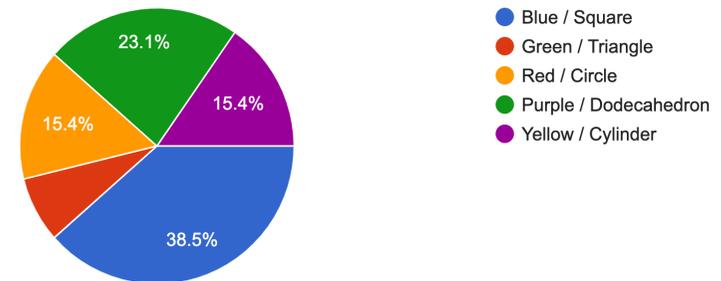
Question 2: Have you used VR before

13 responses

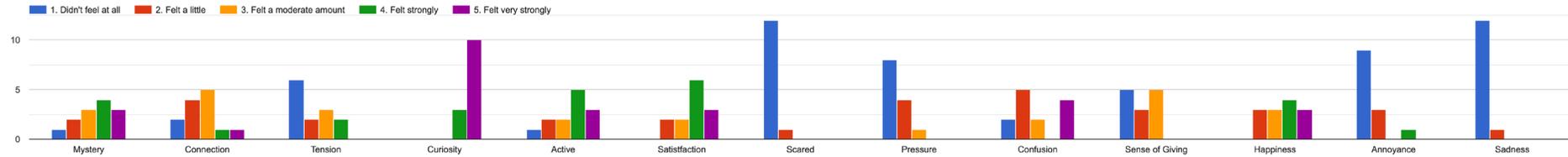


Question 3: Which room did you find the most interesting

13 responses



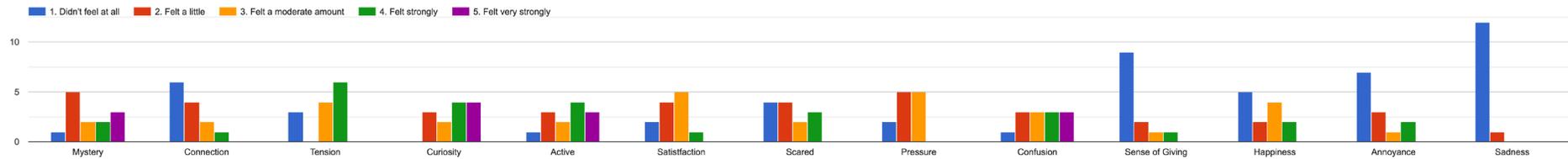
Question 4: When reflecting on your experience in the Blue / Square room, On a scale of 1 - Didn't feel at all to 5 - Felt very strongly, what words best describe the feeling you had in the space



Question 5: What do you think the theme of this room is?  
11 responses

- interactivity
- Curiosity: It felt like looking at the stars, i would have like more boxes to throw i would have spent longer in the room watching the collisions
- Im guessing loneliness or anxiety, because of the colour blue representing with blue often. Sense of loneliness may be felt because of the large amount of squares surroundings, but cant interact with all of them, sometimes they are too far way or too high etc. Also feelings of wanting to reach them, but aren't able to.
- Chaos, initiating motion and energy from elements
- collisions
- Space & Connections - like with magnets in a way.
- I think the theme is connecting and the goal is to form the longest connection, I lost some satisfaction as this room broke during the play through so didn't show me when the puzzle was completed
- Very cool
- Connection, grouping,
- Loneliness
- chain reaction, connectedness

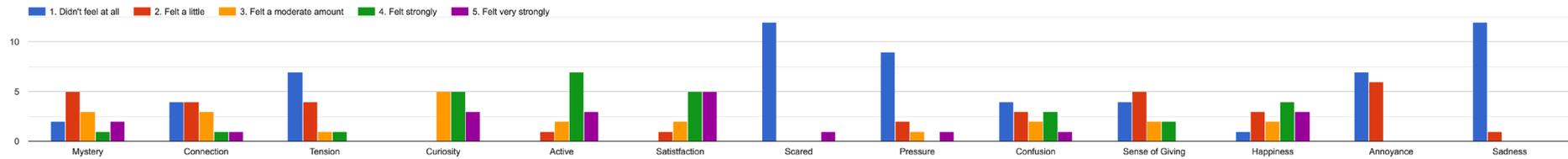
Question 6: When reflecting on your experience in the Green / Triangle room, On a scale of 1 - Didn't feel at all to 5 - Felt very strongly, what words best describe the feeling you had in the space



Question 7: What do you think the theme of this room is?  
11 responses

- unsure
- Pressure/claustrophobia: initially I recoiled from the stabs and wanted to hide in the middle of the room but then the lucid dreaming feeling of testing game mechanics kicked in and I wanted to watch myself being impaled
- May be anger or self defending, the pointy green parts goes in and out, larger and larger. But when touching them it turns small again. It feels like a person or the room is trying to defend themselves from anyone trying to be close to them.
- Imprisonment, caged
- pressure
- Attraction?
- Perhaps pushing back against threats? the spikes were intimidating
- It was very confusing, but I liked how it changed to spiky.
- Pressure, Anxiety,
- Claustrophobic/Feeling Pressured
- claustrophobia, being attacked, being hurt

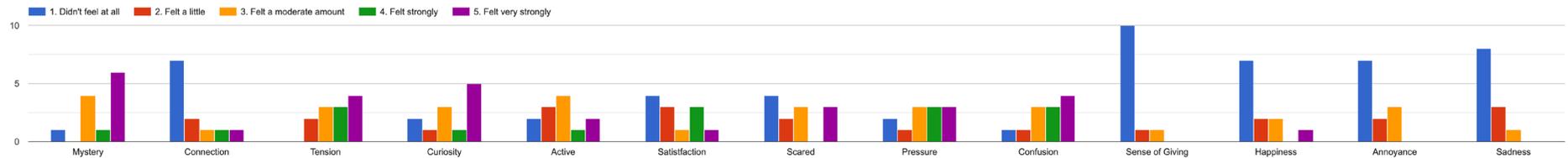
Question 8: When reflecting on your experience in the Yellow / Capsule room, On a scale of 1 - Didn't feel at all to 5 - Felt very strongly, what words best describe the feeling you had in the space



Question 9: What do you think the theme of this room is?  
10 responses

- popping items
- Childlike joy. just being a kid again popping bubbles. I could spend a gess in here I kept reloading it so i could keep popping it would be cool if the cylinder reset :)
- Happiness? The rounded shape and yellow gives a sense of happy vibe. The only platform to stand makes me feel that we loose happiness very easily. We can fall off the ground easily.
- Not sure, but it seemed like you are the outside force popping all these shapes
- bursting
- Like a burst of happiness? Reminds of popping the bubbles
- Popping!
- How it worked once you got all of them.
- Acceptance/Welcoming
- frivolity, fun, motion

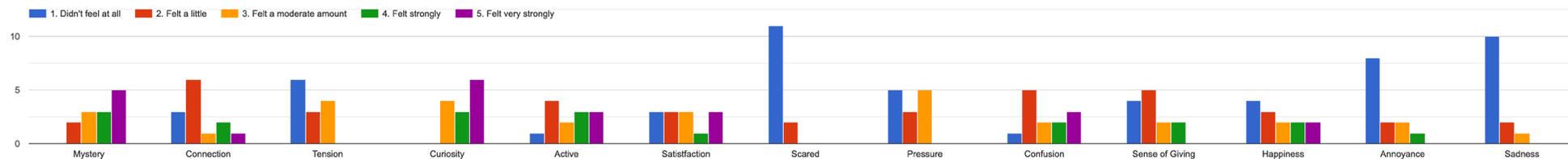
Question 10: When reflecting on your experience in the Red / Circle room, On a scale of 1 - Didn't feel at all to 5 - Felt very strongly, what words best describe the feeling you had in the space



Question 11: What do you think the theme of this room is?  
10 responses

- missed this room
- Isolation. This was really creepy/anxiety inducing. Once i worked out there was no interaction I wanted to leave asap
- I feel a sense of anger to the environment or society. Like the room is angry and giving pressure to it's self - Where Im inside of it. Makes me feel like the room will explode in the future.
- Avoidance, the eyes are watching but every-time you get closer they disappear
- probing eyes
- Tension - feel like I've been stared at - bare.
- Eyes! Staring back at the eyes, and if I ignore them they move closer
- I liked the creepy eyes and how they turned blue
- Anxiety
- staring contest, paranoia

Question 12: When reflecting on your experience in the Purple / Dodecahedron room, On a scale of 1 - Didn't feel at all to 5 - Felt very strongly, what words best describe the feeling you had in the space



Question 13: What do you think the theme of this room is?

10 responses

- noise
- Restriction? i wanted to be able to put the purple cube in the boxes and the fact that I couldn't was annoying, also really wanted to be able to open drawers higher up but couldn't reach :(
- Surrounding by all the walls and the shapes, allows me with very limited space, which i feel the pressure through it, which Im guessing the theme might be Pressure. Altho I have the freedom to interact with the boxes, but i feel trapped.
- It took me awhile to figure out that the shapes are little drawers, I was hoping there would be something to put inside or to find something? Maybe there was but I couldn't find it.
- treasure hunt
- Puzzles - like treasure hunt
- Storage and cupboards, so maybe it's organisation?
- I liked going through the different draws and interacting with the pedestal.
- Being at your lowest point
- secrecy, obscurity

Question 14: Is there any additional feedback you would like to provide?

9 responses

- The room with eyes is very mysterious, and also scary too. It would be nice if more interaction can be made with the eye, I was wishing something surprising can happen. The freedom and infinity feel of the blue room is a very interesting experience, I love how I can throw the blue squares around so much! Feels lot more control and more playable within the blue room.
- Not really, but I would like to know what the end goal is for this project? To understand the goal then I can better understand the levels
- no
- I really enjoyed this game, the puzzles were awesome! My favourite room to complete was the popping room since there was a strong reaction after I'd finished the goal, a similar response to the other levels would be fun! The triangle, circle and square rooms felt less clear when the goal was completed (but was still fun to complete and satisfying to figure out)
- I did struggle a lot with how it first worked, but once I understood it was easier to clear each room to the finish.
- The edges on the rooms that you have to reach for feel too far out. Having a way to walk teleport to them or interact while standing could make it a more comfortable experience. I kept accidentally changing areas when interacting with the cube when unintended.
- It was a good experience despite being a bit confusing at the start. A fun first VR time :)
- I liked how it was relatively easy to figure out what to do in most of the rooms without much information or text. I liked the satisfaction of figuring it out on my own and succeeding and then slowly realising that the game was keeping track of my "completion", which took me until the 4th room to notice. It was fun :-)
- I really enjoyed it! I don't play video game at all so it took me a little longer to pick up but I liked having to figure everything out and the themes were very well conveyed.

## APPENDIX C:

### Notes



**From:** humanethics@massey.ac.nz  
**Subject:** [HE007] - Human Ethics Notification - 4000025924  
**Date:** 5 May 2022 at 10:06 PM  
**To:** Nikko.Hull.1@uni.massey.ac.nz, T.Marriott@massey.ac.nz  
**Cc:** humanethics@massey.ac.nz

Kia ora,

[Link to the application](#)  
HoU Review Group

Ethics Notification Number: 4000025924  
Title: Shaped: Exploration of wellbeing

Thank you for your notification which you have assessed as low risk.

Your project has been recorded in our database for inclusion in the Annual Report of the Massey University Human Ethics Committee.

The low risk notification for this project is valid for a maximum of three years.

Please notify me if situations subsequently occur which cause you to reconsider your initial ethical analysis that it is safe to proceed without approval by one of the University's Human Ethics Committees.

Please note that travel undertaken by students must be approved by the supervisor and the relevant Pro Vice-Chancellor and be in accordance with the Policy and Procedures for Course-Related Student Travel Overseas. In addition, the supervisor must advise the University's Insurance Officer.

A reminder to include the following statement on all public documents:

"This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher(s) named in this document are responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you want to raise with someone other than the researcher(s), please contact Professor Craig Johnson, Director (Research Ethics), email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)."

Please note that if a sponsoring organisation, funding authority or a journal in which you wish to publish require evidence of committee approval (with an approval number), you will have to complete the application form again answering yes to the publication question to provide more information to go before one of the University's Human Ethics Committees. You should also note that such an approval can only be provided prior to the commencement of the research.

You are reminded that staff researchers and supervisors are fully responsible for ensuring that the information in the low risk notification has met the requirements and guidelines for submission of a low risk notification.

If you wish to print an official copy of this letter:

1. Please login to the RIMS system (<https://rims.massey.ac.nz>).
2. In the Ethics menu, select Ethics Applications.
3. Using the Advanced search with appropriate criteria to find only this application.
4. With the application on the Results tab, select Reports from the toolbar.
5. Select the "Human Ethics - Low Risk Notification Letter" link, this will open the report viewer.
6. Select the application code from the Report Parameters dropdown and submit. You can then select an export option from the top toolbar (Print, Save).

Yours sincerely  
Professor Craig Johnson  
Chair, Human Ethics Chairs' Committee and  
Director (Research Ethics)